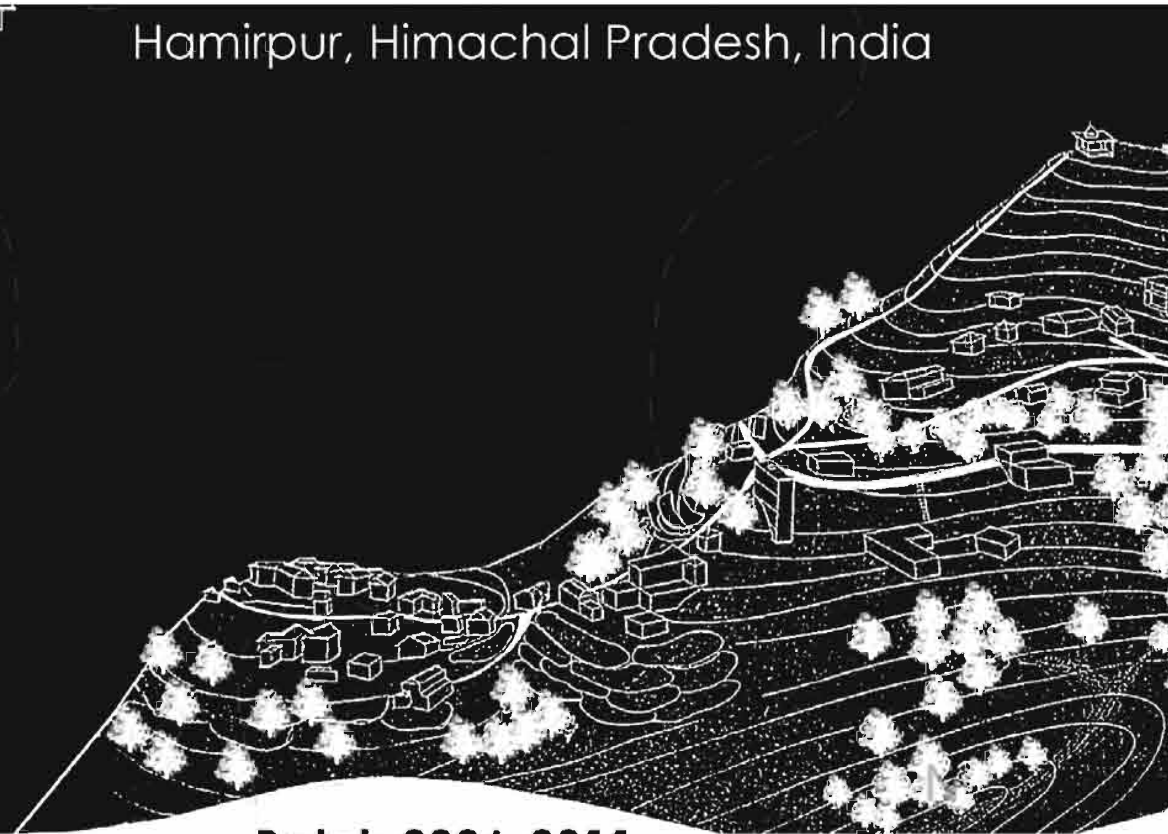


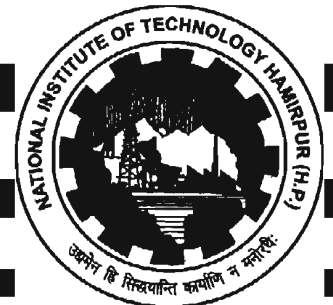
KHYAH VILLAGE SETTLEMENT

Hamirpur, Himachal Pradesh, India



Batch 2006-2011
Department of Architecture

Guide: Ar. Amitava Sarkar



Khyah Village Settlement

Hamirpur, Himachal Pradesh, India

A Design Research Report

by
Batch 2006-2011
B.Arch

Under the guidance of
Ar. Amitava Sarkar



to the
Architecture Department
National Institute of Technology Hamirpur
Hamirpur, H.P.-177005, India

April, 2008

ACKNOWLEDGEMENT

We sincerely thank all the officials of Khyah village Panchayat office for their kind support to carry out the survey in the village.
We are also grateful to the people of Khyah village for their kind cooperation and gracious hospitality

From
B.Arch Batch 2006-11
National Institute of Technology Hamirpur H.P. 177005

EPILOGUE

As a part of the architectural design research we have this opportunity to develop an architectural image of a village in District Hamirpur, Himachal Pradesh.

The objective of the case study is to learn the Rural Settlement Pattern and Traditional Building Technology. In this context the Khyah village have been surveyed and studied under following parameters:

1. Architectural planning pattern
2. Building Typology present
3. Architectural design
4. Climatic impact on Architecture
5. Building details
6. Services

We have also tried to find out

- the initial settlement choices by the villagers and the further morphological growth of village with respect to time.
- the impact of Asphalt road introduced to the village by the Government
- Impact of Topography, climate, orientation, hydrology etc on the settlement choices.

The village has been surveyed for master plan and the Historical background of the village has been discussed with the villagers itself.

The individual house units and public buildings are surveyed and plan, sections, elevations, site plan are prepared.

The proposal for facilities has been figured out, which will be beneficial for the better future of Khyah village.

vernacular principles of architectural planning and design have been observed and listed for the future references.

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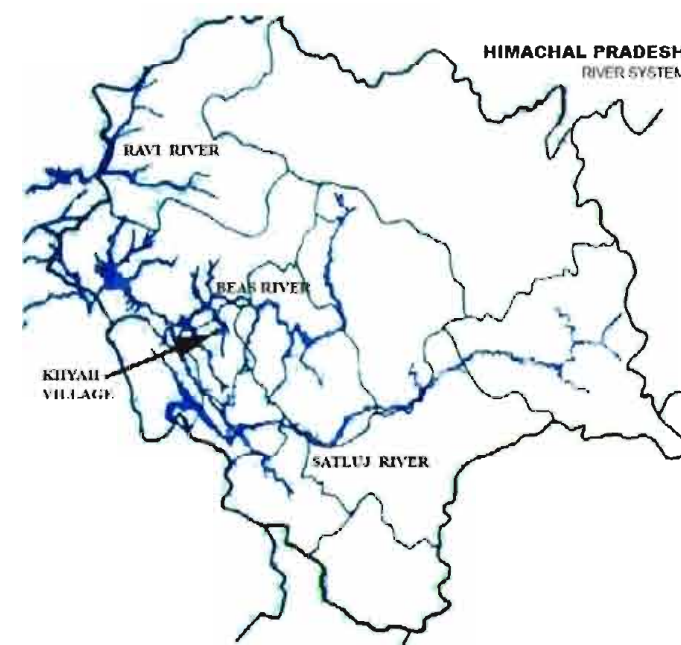
INTRODUCTION

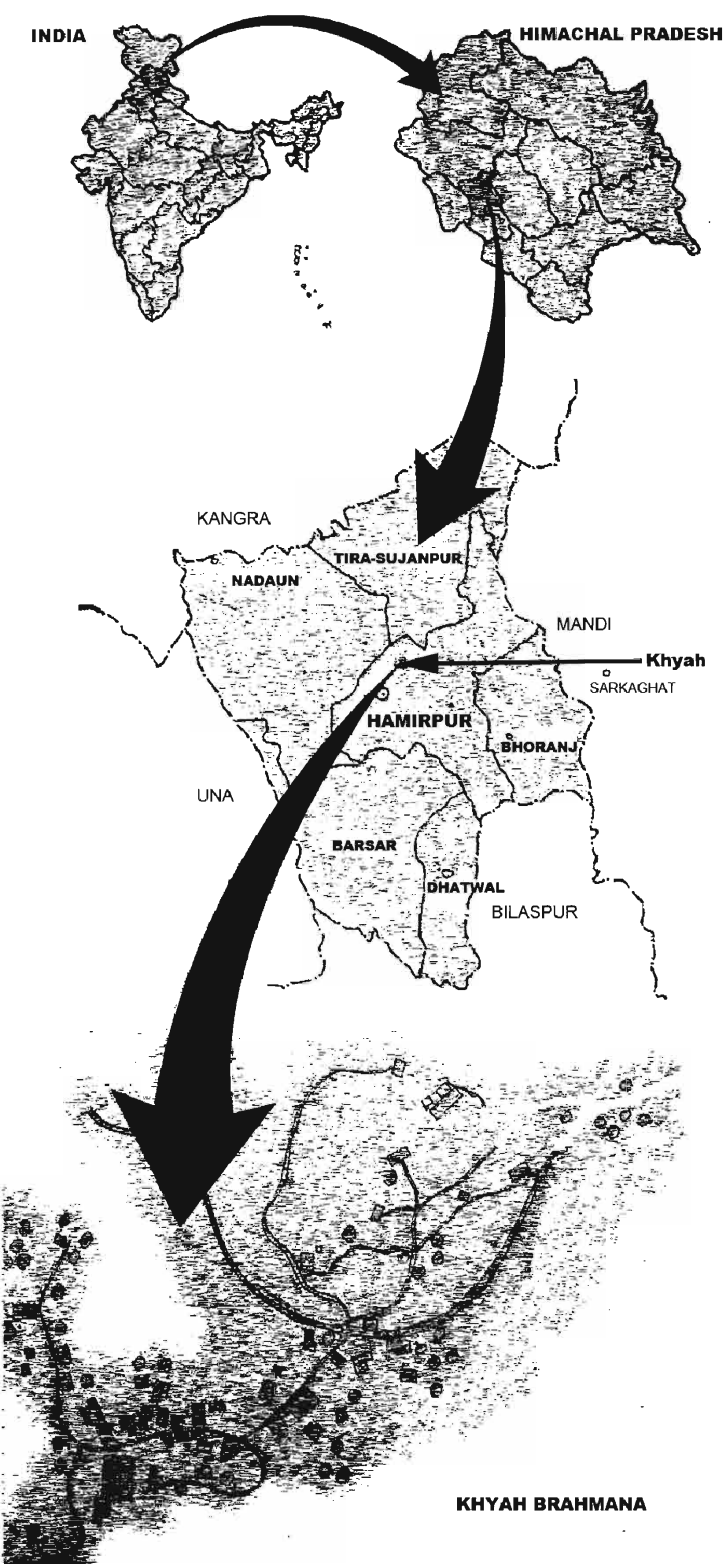
Hamirpur district is one of the biggest educational hubs in Himachal Pradesh. Due to its presence in the foothills of the Shivalik mountain ranges it receives heavy rainfalls. Sloping slate roofs are the typical architectural symbols of this region. The Katoch Dynasty ruled the area between the Ravi and Satluj rivers in olden days. It became predominant during the period of Hamir Chand who ruled from 1700 AD to 1740 AD. , the present town of Hamirpur got this name from this ruler. Raja Sansar Chand ruled the region from 1775 to 1823 Ad. Sikhs ruled the region till 1846 and after that it became part of British empire till 1947, then the area came under Govt. of India. Khyah is one of the 209 Panchayats and Khyah Brahmana is one of the 1617 villages . The earlier constructions in the Khyah Panchayat area started around year 1900- 1910 due to World war-I ,people settled here as it was safe place. Although settling in the existing town would have been a better idea but cheaper land was available as and where required in these remote areas and people chose to settle here in near vicinity of the main town. The area has an irregular terrain. The settlement is mainly concentrated around the main city or in near vicinity of it. The lack of facilities and the geographical constrains have probably limited the growth to a small area of some 6 sq. kms. Some less concentrated areas of growth are located along the road to Sujanpur Tira, that's all one can see at the first glance, but there are some sporadic settlements in the interiors, comparatively speaking far from the town where there was nothing in the name of facilities until some twenty years back. The area of Hamirpur is drained by the Indus river system. A number of perennial streams (Khad) which are tributaries of either the Beas or the Satluj run across the district. Pung Khad (Pung Basin) is nearest to village Khyah.



RIVER BEAS:
BAKAR KHAD
MAN KHAD
PUNG KHAD
KUNHA KHAD

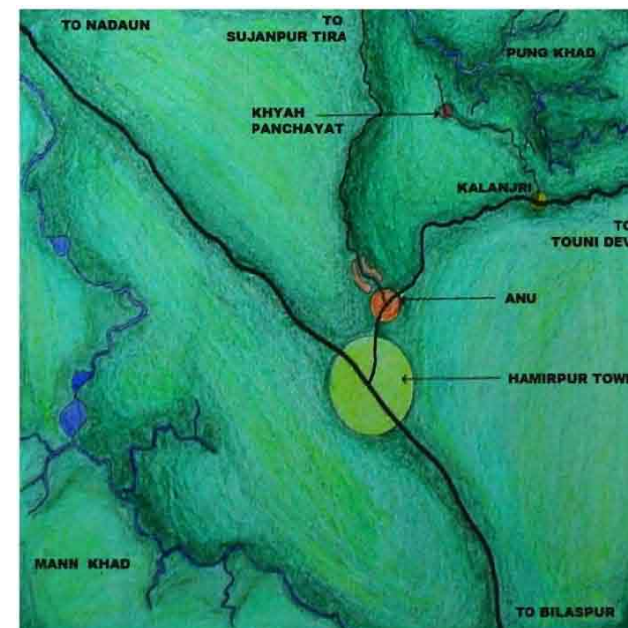
RIVER SATLUJ
SUKAR KHAD
MUNDKHAR KHAD





LOCATION

•Khyah Brahmana is in Panchayat Khyah and located at a distance of around 10 km, from the main city of Hamirpur, some about 500 m from the Pung Khad, another tributary of the Beas, constituting of about 35 houses spread over an area of some 2 sq. km with a population of nearly 200 people.



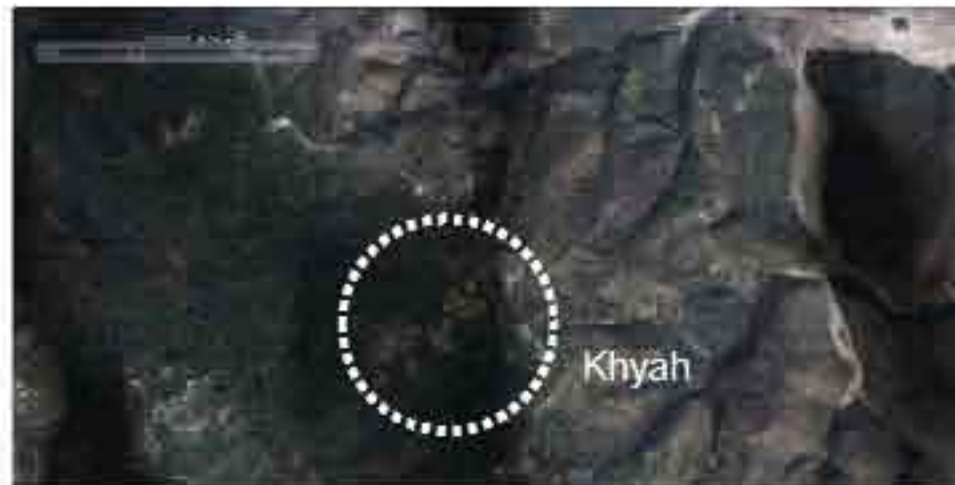
	INDIA	HIMACHAL	HAMIRPUR	KHYAH
LATITUDE	8°4' TO 37°6' N	30°22' TO 30°12' N	31°53'35" TO 31°24'48" N	31°N
LONGITUDE	68°7' TO 97°25' E	75°47' TO 79°4' E	76°17'50" TO 76°43'42" E	76°E
ELEVATION ABOVE MSL	0M-8598M	350M-6517M	400M-1100M	800M

ROAD LINK		RAIL LINK	AIR LINK
HAMIRPUR-PATHANKOT	180KM	<ul style="list-style-type: none"> HAMIRPUR IS WELL CONNECTED BY NEAREST BROAD GAUGE TRAIN AT UNA 80KM PATHANKOT BROAD GAUGE 185KM NEAREST NARROW GAUGE AT RANITAL 	<ul style="list-style-type: none"> NEAREST AIRPORT AT GAGGAL(KANGRA) 83KM SHIMLA AIRPORT 174KM DIRECT FLIGHTS FROM DELHI-SHIMLA AND MUMBAI-SHIMLA
HAMIRPUR-DHARAMSHALA	94KM		
HAMIRPUR-DELHI	450KM		
HAMIRPUR-CHANDIGARH	260KM		
HAMIRPUR-SHIMLA	250KM		

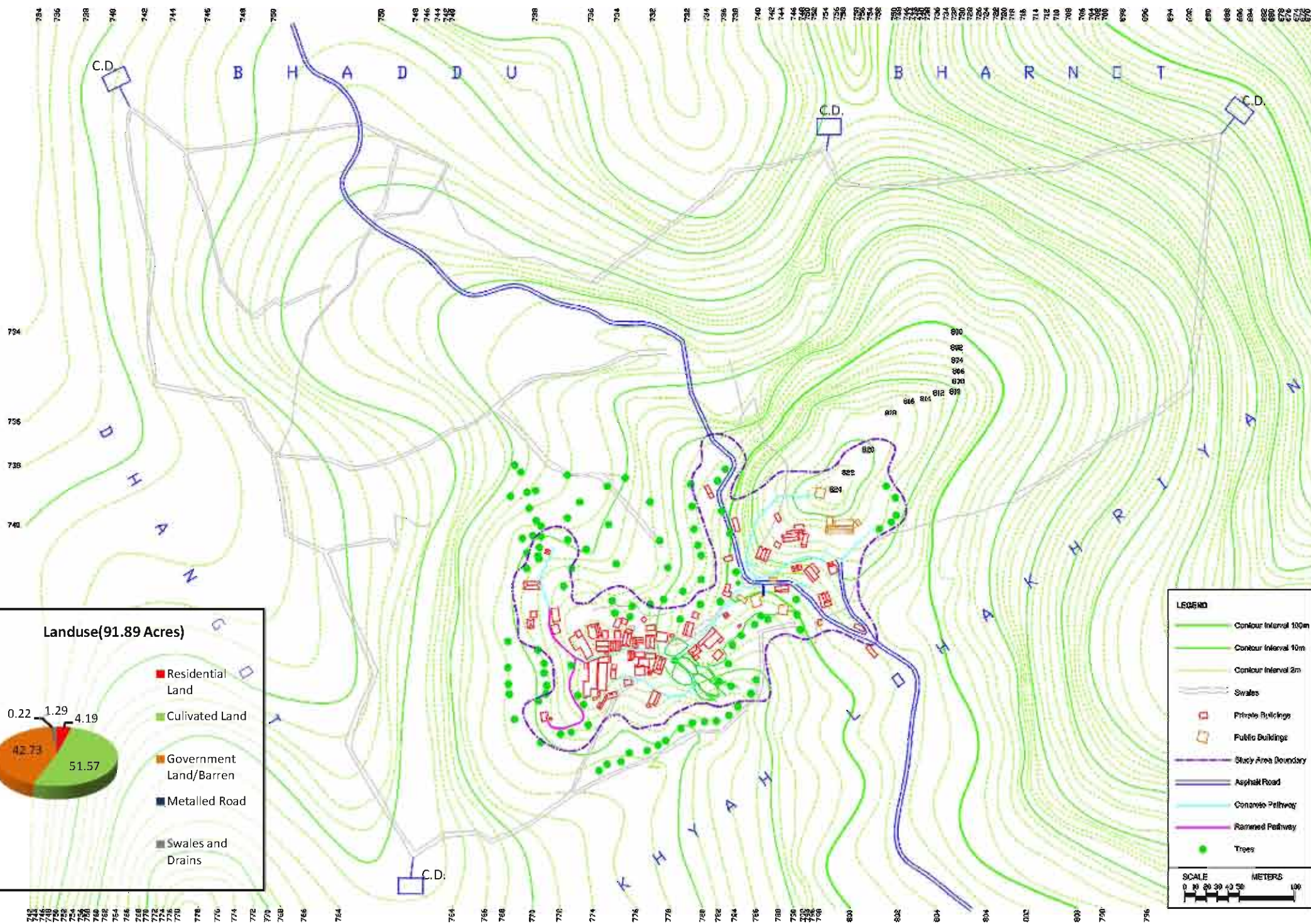
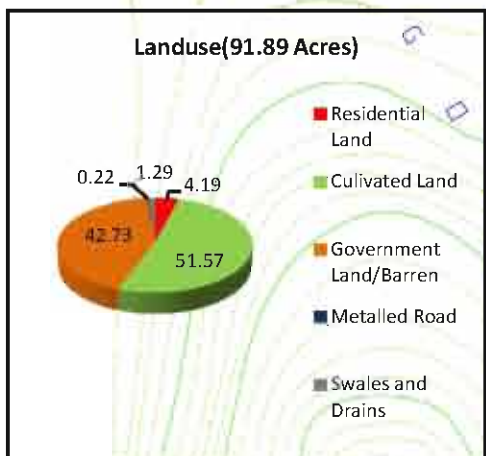
THE AVRAGE ANNUAL RAINFALL IS ABOUT 1600MM

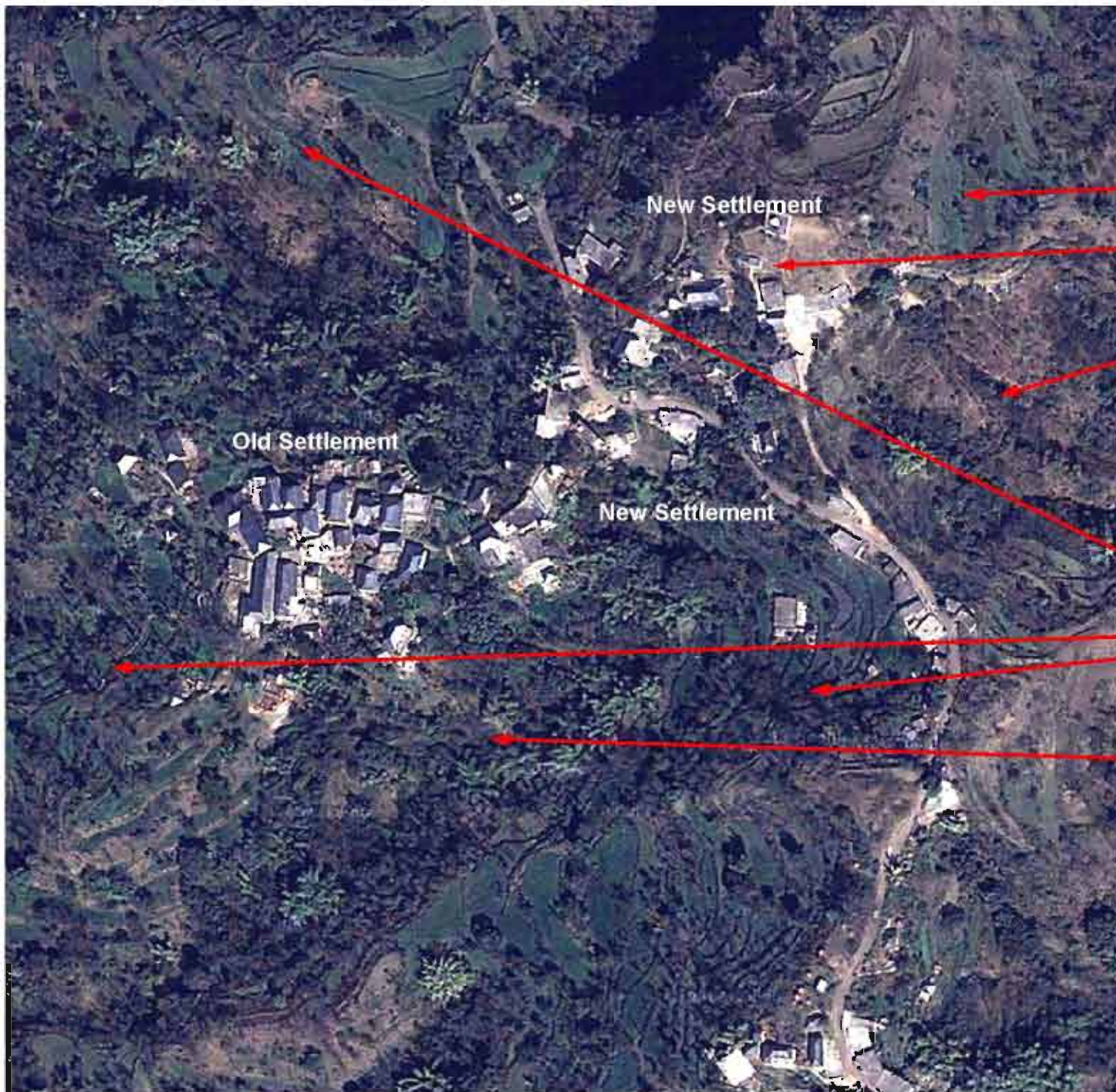
Slope:

- Slope is variant and varies from 1% to 50%
- The village is situated on the western slopes
- Village is located such that it receives late morning sun and the sunlight remains till the late evening.
- Village received strong solar radiations during the daytime.

Summer**Monsoon****Winter****Morning Sun****Evening Sun**

MASTER PLAN





Fields

Hilltop

Barren Land

Fields

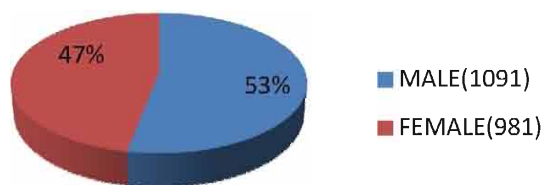
Valley

DEMOGRAPHIC DETAILS

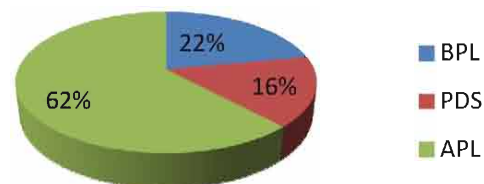
KHYAH

- Khyah Panchayat is in Tehsil Hamirpur in District Hamirpur
- Khyah is village spread over an estimated area of 6 sq. km.
- It is located on hill.
- It has population of 1844 people.
- Of these 964 are male & 870 female.
- The people belong to various caste & economic statuses.

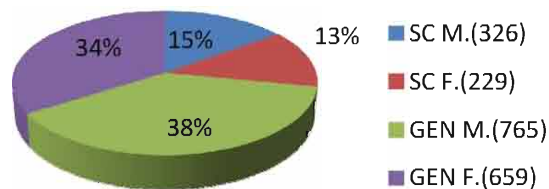
SEX RATIO



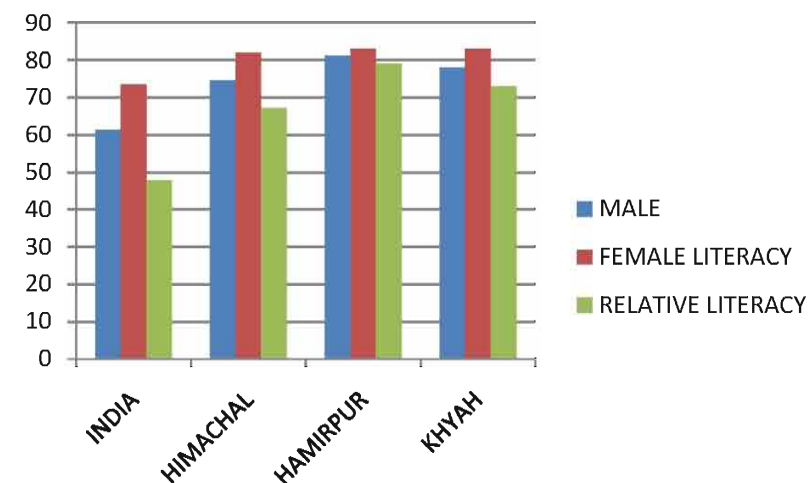
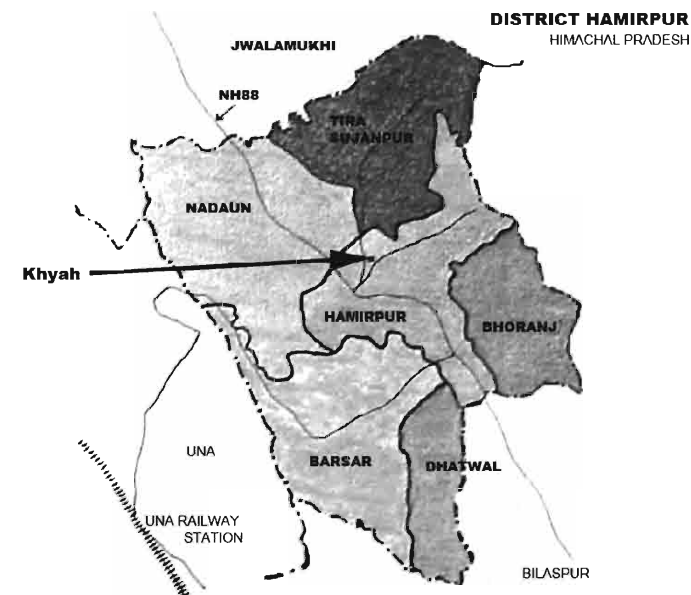
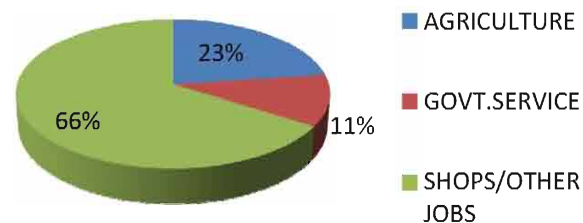
FAMILY STATUS



CASTE



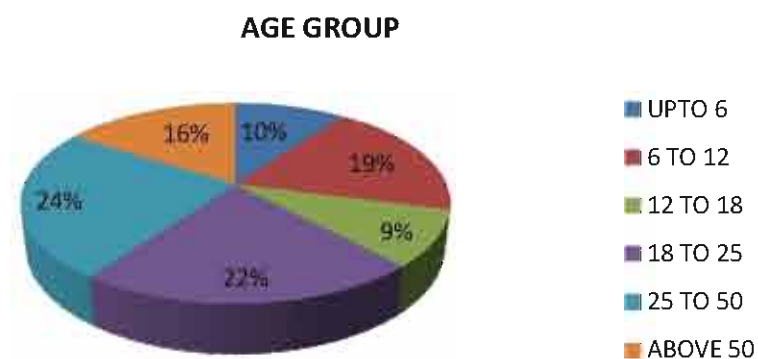
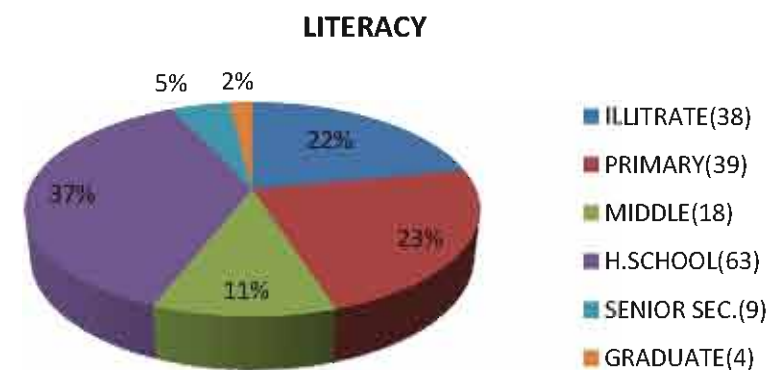
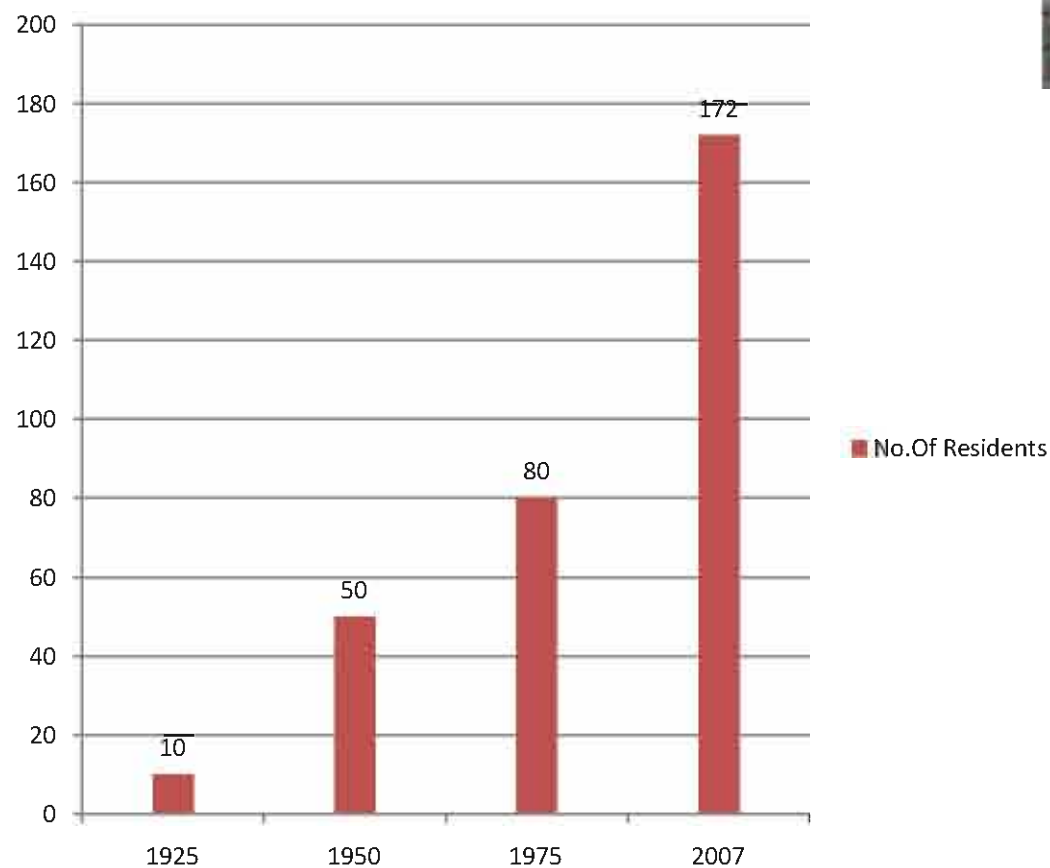
ECONOMY



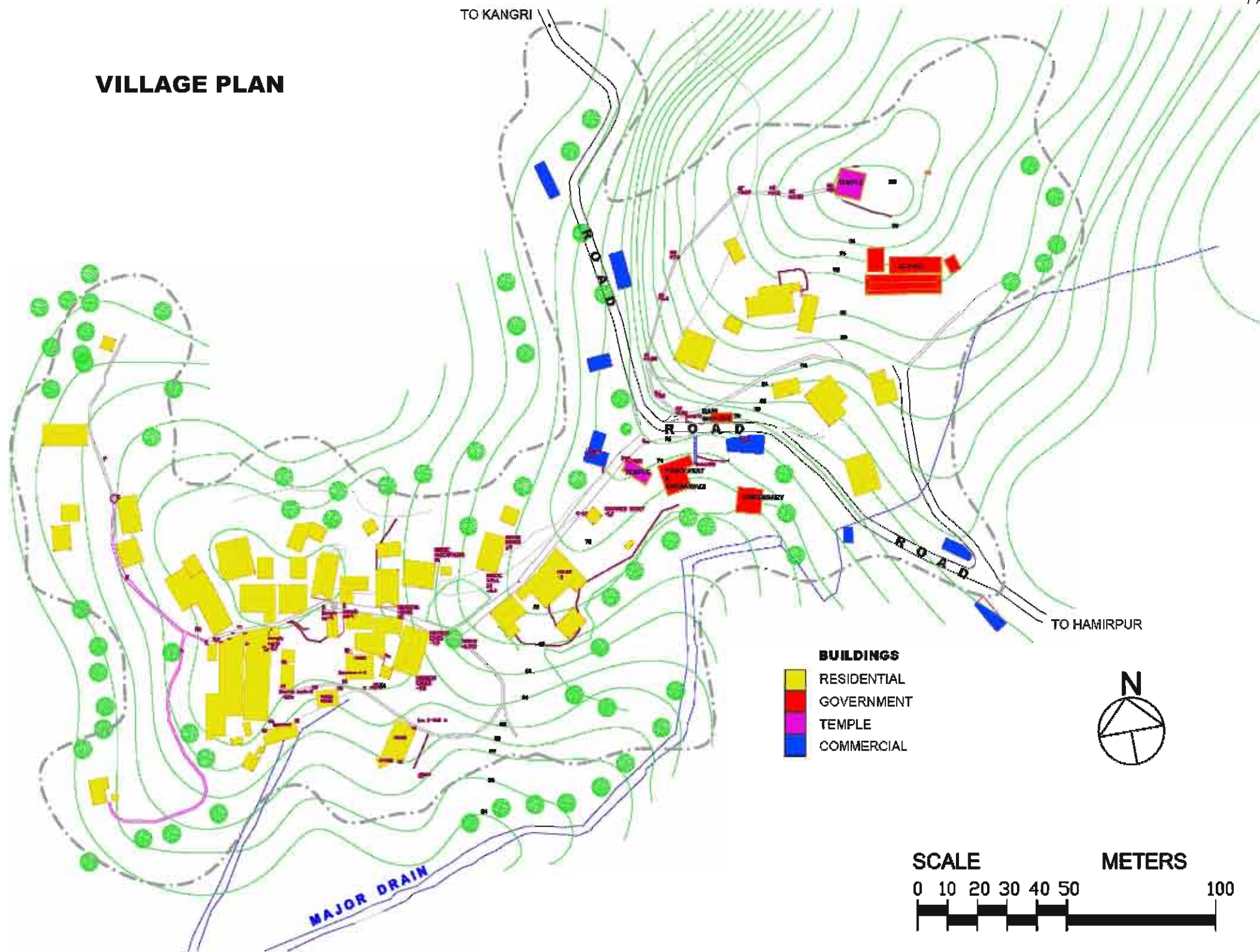
KHYAH BRAHMANA

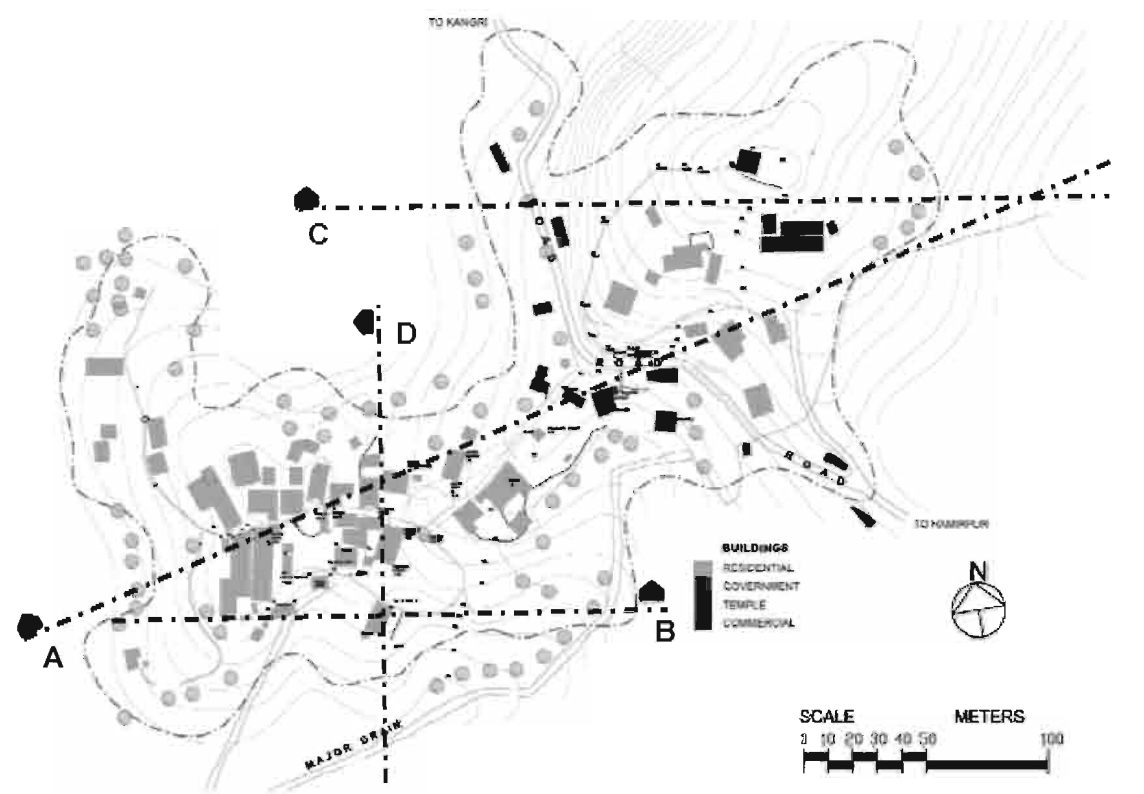
It is the area for the upper caste people and hence the more dominant in the village.

- It constitutes of houses both “KACCHA(Mud)” & “PAKKA”.
- These houses are spread over an area of around 20000 sq. m.
- There are 172 people living in these houses.



VILLAGE PLAN





SECTION A



SECTION B



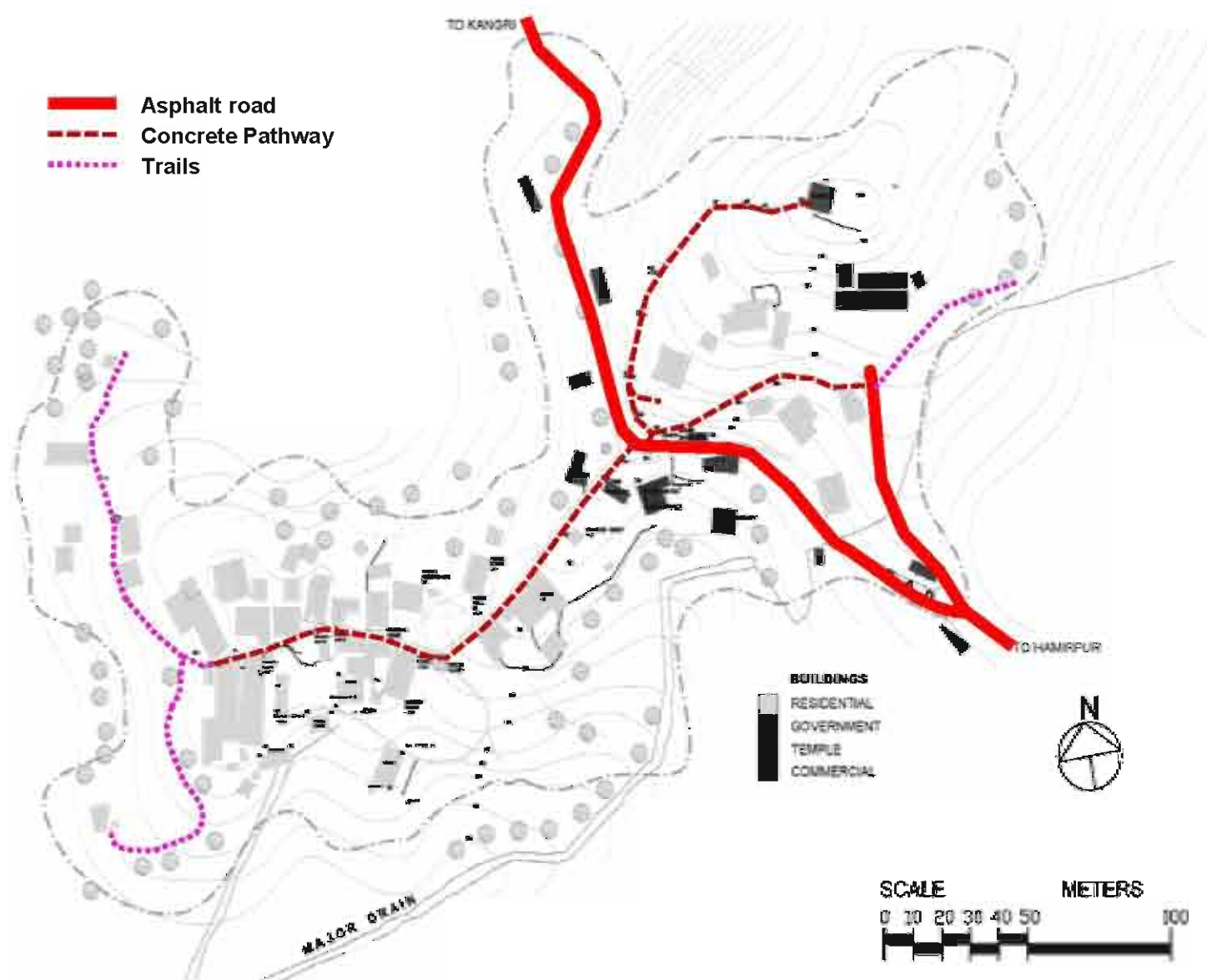
SECTION C



SECTION D

Village History

- There are numerous stories about how and who settled first of all and exactly when
- One story says that Mr. Teka Ram from Amb immigrated here some hundred years back and laid the foundation of the village and today half of the residences are his blood.
- Another belief is that Mr. Kinha s/o Mr. Dewan Chand f/o Mr. Suresh Kumar probably settled in area around 100 years back.
- This oldest house stands today in pathetic condition unlike some others that have been renovated.
- First the population was concentrated on a small platform about 100 m away from the road.
- This area was referred to as Abadi.
- Growth was concentrated around this hub till 1960.
- Gradually buildings began to appear on the side of the road.
- In 80's And 90's the growth pattern shifted closer to the road
- Constructions prior to 1950 exhibit the use of solid mud walls, adobe blocks, bamboo, another local material.
- Stone walls used rarely.
- Stone was used up to plinth level in constructions dating from 60's to 70's.
- Buildings built after 1990 have generally used kiln burnt bricks, cement mortar and RCC.
- 2 temples, Panchayat house, primary health care centre, rain shelter, four shops and some other public buildings have been built with in the last 10 years.



Roads and Pathways:

Observation:

- Main road connecting the village to other villages is metalled and internal Pathways are cement pathways or trails.
- Pathways are in Bad condition in lower village.
- Pathways are of 1.2m in the beginning but further down to village it becomes of width 0.5m.
- Problem of water clogging in internal pathways is there in the village.

Inferences:

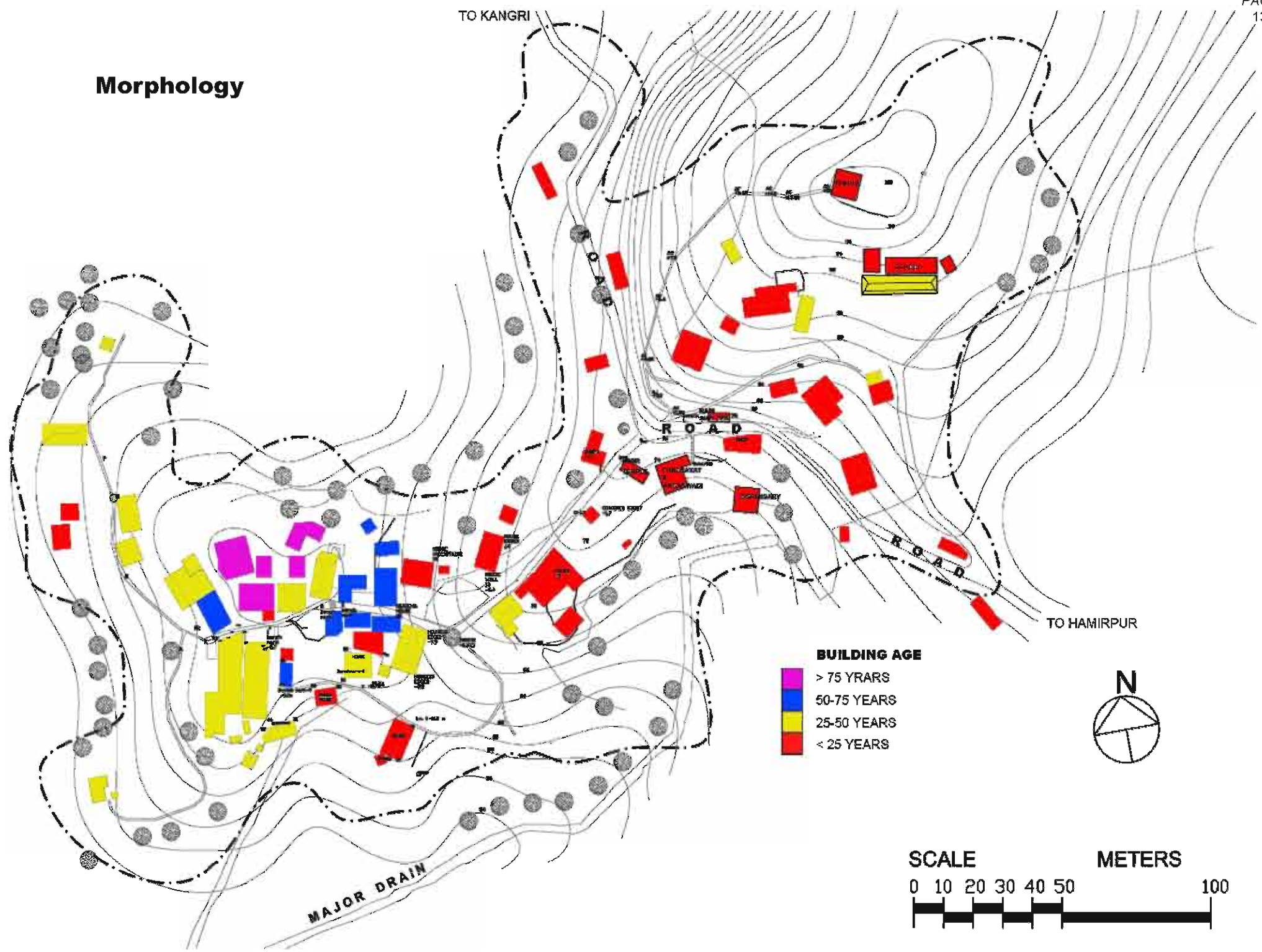
- Pathways should have at least width of 1.5m in internal areas of the village to allow at least two wheelers to cross.
- A common parking should be provided along the Main road if the pathway width is impossible to increase

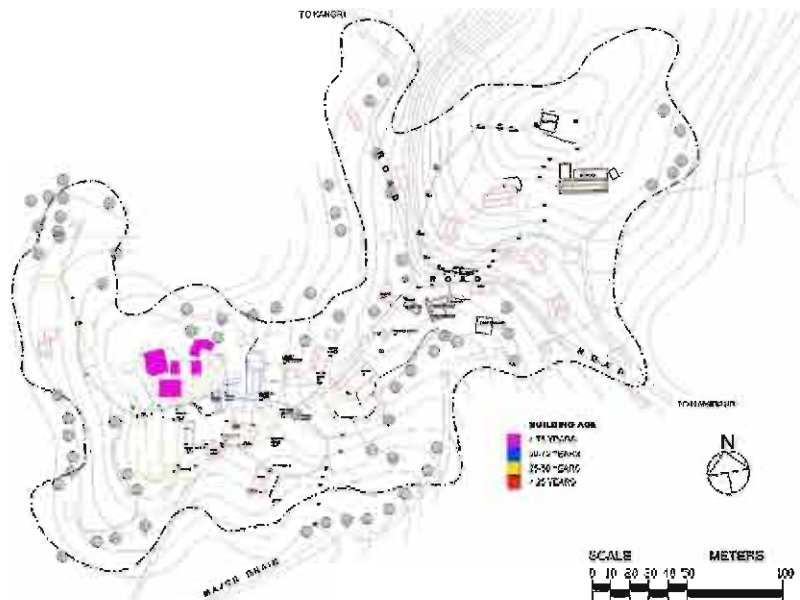
Facilities:

The village survived in the dark for nearly 80 years . The Parliamentary Act of 80's and 90's shed some light on the plight of such villages. A metalled road was constructed over the existing cart-road in the year 1991-1992. A regular bus service was also started around the year 1997. Electricity was provided in the year 1984. Water supply was provided in the year 1979. In the continuation of village development , a **Panchayat House** (1995) , a **Child Care Centre** (1995) and a **Dispensary** (2001) Had been provided to the village. To provide the education facility a **Primary School** was started in 1961 and has been extended thrice since then in 1997, 2002 and 2005. A **community built temple(2004)** stands on the hill top which acts as a worship place for villagers. This temple place has been existed since the old days of the village but the Temple building was constructed in 2004. Another **privately built temple(2002)** stands near the Panchayat House.

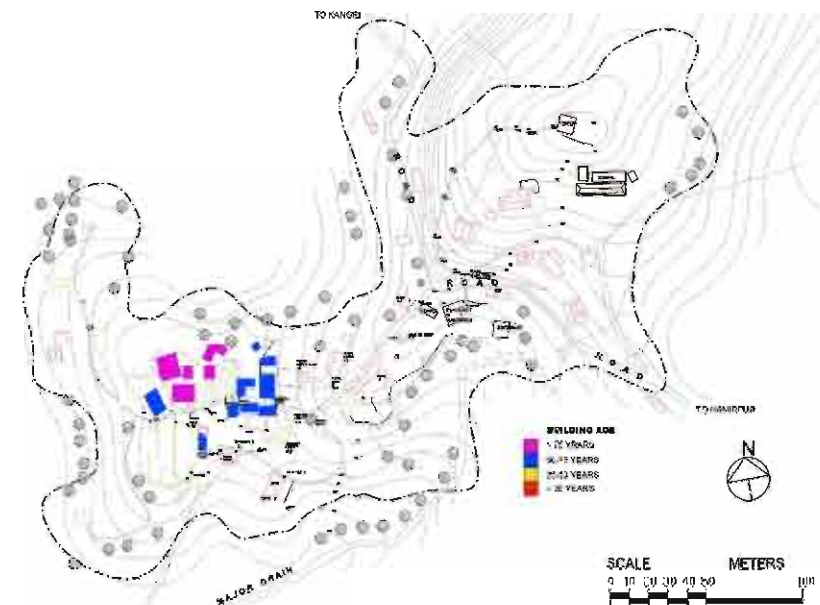
Nearby Hospital: Zonal Hospital-10km	Nearby University: NIT Hamirpur-8km	Nearby College: Gov.College Anu-8km	Nearby Market: Hamirpur- 10km
			
<p>Private Temple:</p> <ul style="list-style-type: none"> •Centre of religious activities. •Constructed in year 2002. •Dedicated to Lord Hanuman. •Housed in the top floor of a four storey building •The second floor is used as storeroom. •Ground and first floor are used for residential purpose 	<p>Rain Shelter:</p> <ul style="list-style-type: none"> •Built in 2004 by HPPWD •Acts as the bus stop for the village. •Sitting capacity of 10 people •Has no protection for driving rain •Simple RCC slabs are used as seating. 	<p>Panchayat & Child Care Centre:</p> <ul style="list-style-type: none"> •Situated on the community ground adjacent to the rain shelter but below 3.5 m from road level. •The building has three rooms •Two rooms are used as Panchayat House. •One room is used as Anganbadi. •Built in Year 1995. 	<p>Dispensary:</p> <ul style="list-style-type: none"> •Located adjacent to Panchayat House. •Built in year 2001 •The building has two rooms •One room is used as office reception •Second room is used as the Community room.
			
<p>Community Temple:</p> <ul style="list-style-type: none"> •It was built in year 2004 •Situated on the hilltop nearby •Dedicated to Lord Shiva •It has a Grabhriha and Parikrama. 	<p>Primary School: Phase 1</p> <ul style="list-style-type: none"> •The school was started in 1961. •Initially it was up to 5th standard. •It was upgraded to 8th standard in year 1985. •The primary classes are conducted in this building •It has 5 rooms •One of the room is used as Kitchen. 	<p>Primary School: Phase 2</p> <ul style="list-style-type: none"> •This portion was built in year 2002 •It has 6 rooms •One room is used as staffroom •Situated on the back left side of the old building. 	<p>Primary School: Phase 3</p> <ul style="list-style-type: none"> •This portion was built in year 2005 •It consists of 3 rooms •It is situated on the back side of the building. •It is used for classroom of 7th and 8th standard.

Morphology

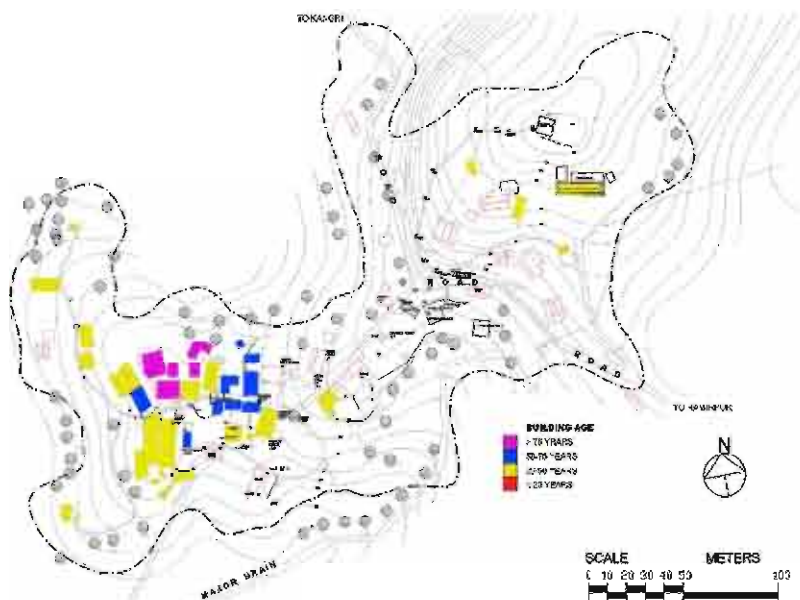




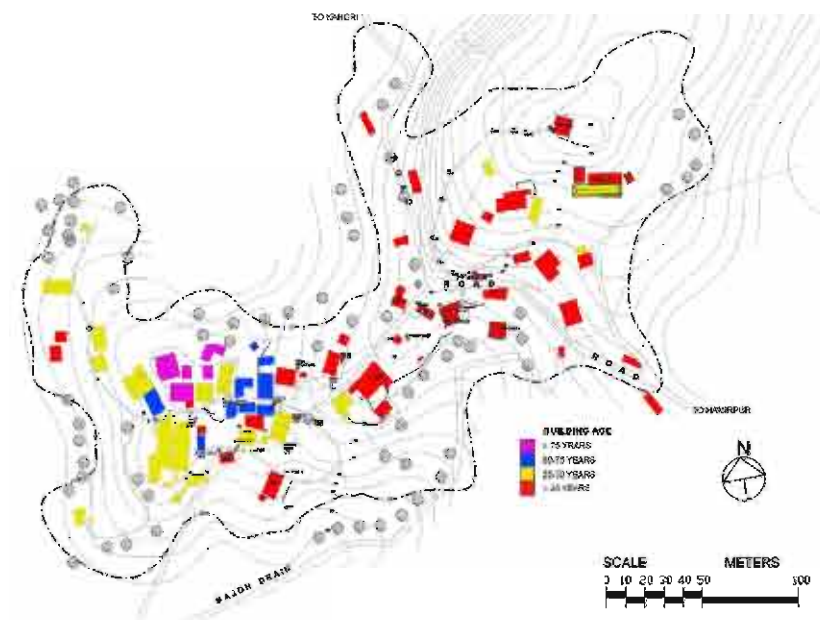
Prior to 1925



1925 to 1950



1950 to 1975



1975 to Present



View of the North-East part of the village Showing fields



Adobe construction with small windows as typical feature



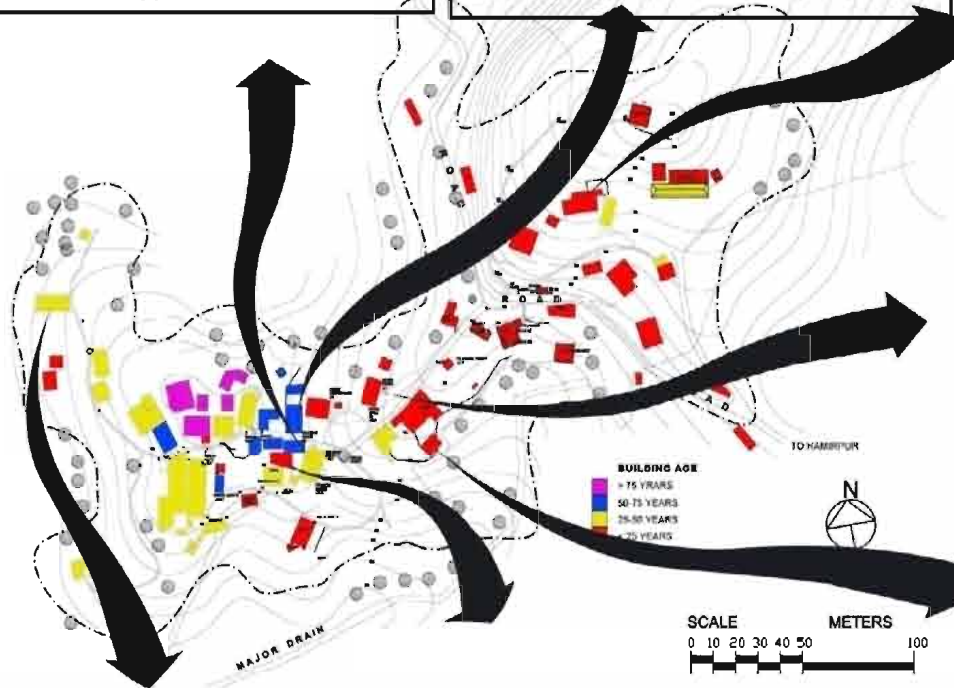
Typical double storey house with covered lean to roof verandah



Semipukka House with side room in verandah



View of the village from hilltop



The house showing transition in building material but the planning is same



A close view of village slate roofs



Cowshed made of Adobe & slate roof with ladder access to f.floor

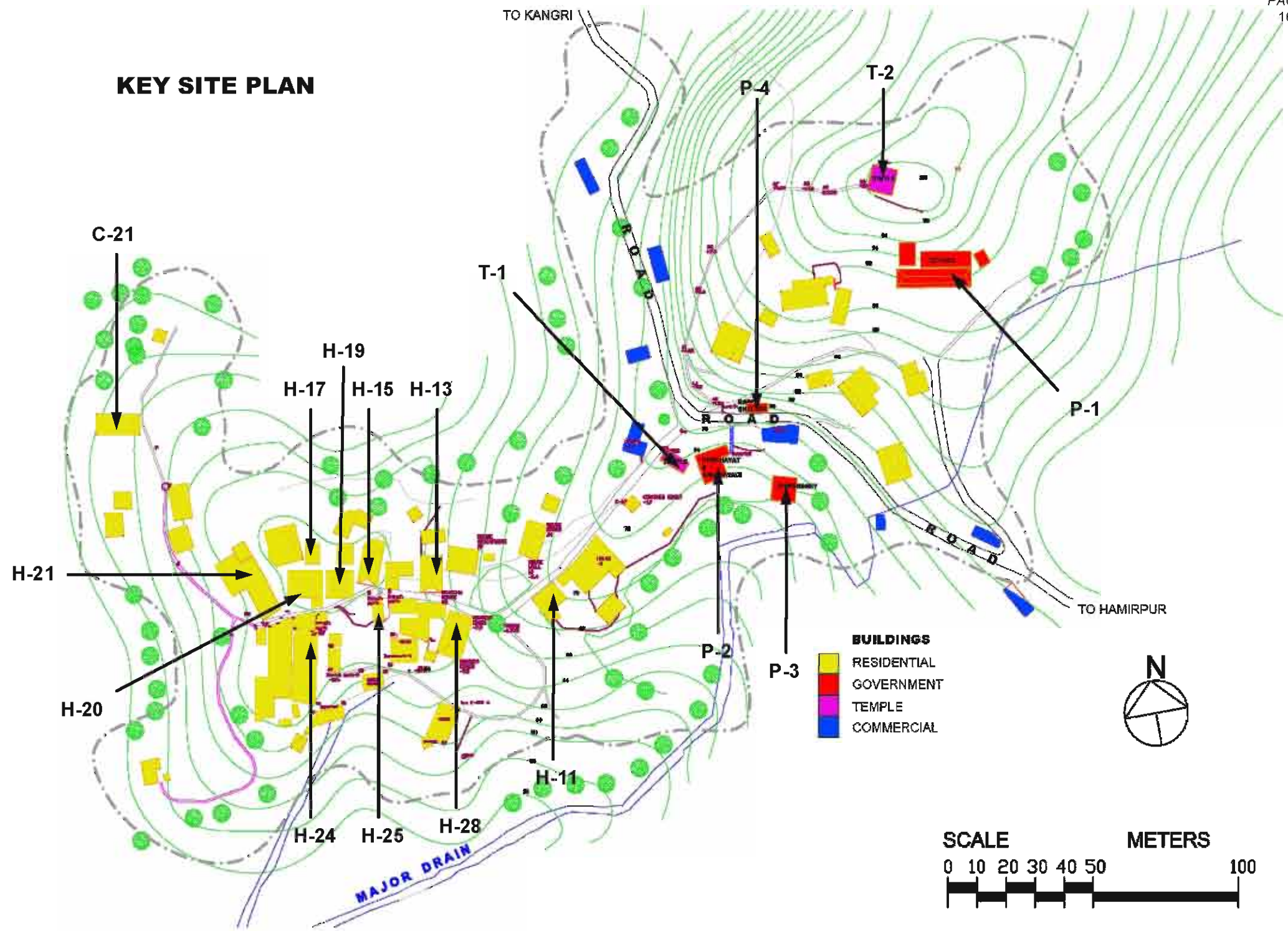


Flat roof structure in addition to the old Adobe House



House showing transition in design from slate covered roof to flat terrace

KEY SITE PLAN



HOUSE NO: H- 17**OWNER :** Sh. Diwan Chand**NO. OF RESIDENTS:**

Male - 2
 Female - 2
 Children - 3

EDUCATIONAL QUALIFICATION:

Owner - Under 10th
 Children - Studying

RELIGION : Hindu**CASTE :** Brahmin**EMPLOYMENT :**

- One male member daily wage earner.

YEAR OF CONSTRUCTION : 1918

CONDITION OF HOUSE : The house is a Kaccha house but the house had phases of construction therefore some portions are Pakka.

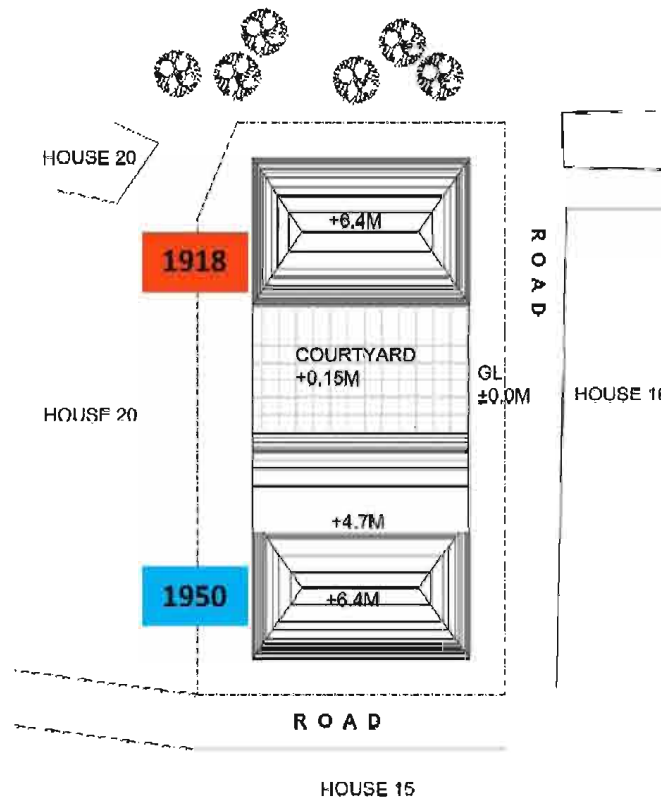
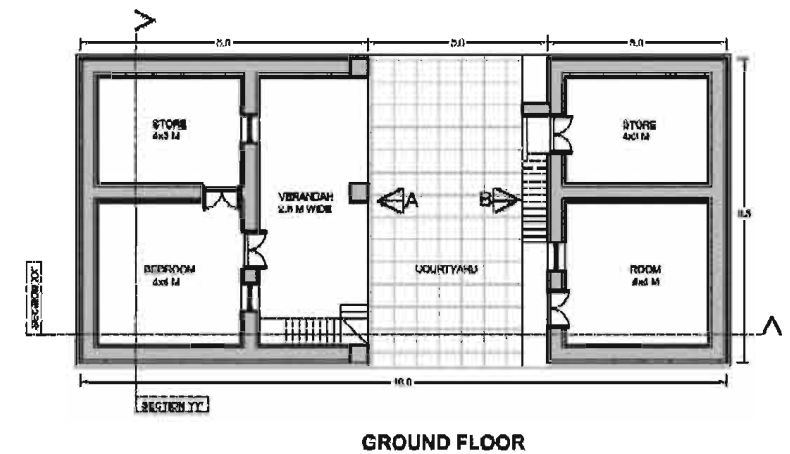
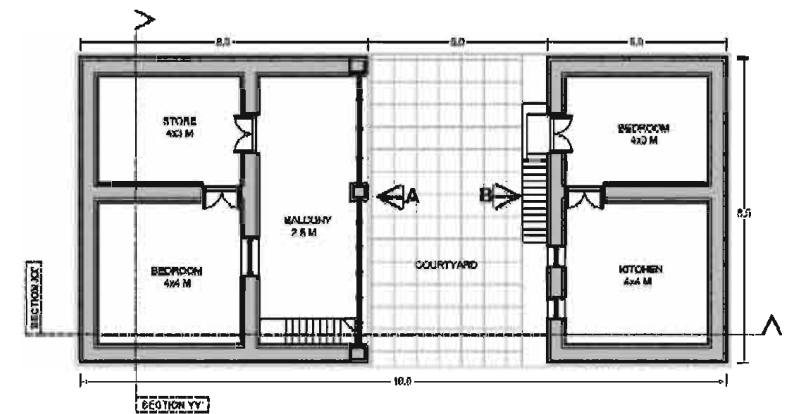
DRAINAGE : Poor with drain water flowing into open.

DRINKING WATER : Tap water

SANITARY CONDITION : Poor sanitation with no proper toilet planned in the house.

PLANNING CONSIDERATION:

- The house follows the ancient system of courtyard planning.
- It has a poor drainage system in which drain water flows into the open.
- There is no toilet in the house and neither was it planned initially.
- The house has been build in phases.

**SITE PLAN****GROUND FLOOR****FIRST FLOOR**

ELEVATIONAL FEATURES:

- The house has two blocks built in two phases.
- The house has predominance of white color with very little green and red color.
- There are no interesting features in the house.
- The elevation otherwise are also not very attracting due to lack of maintenance.

CONSTRUCTION MATERIAL:

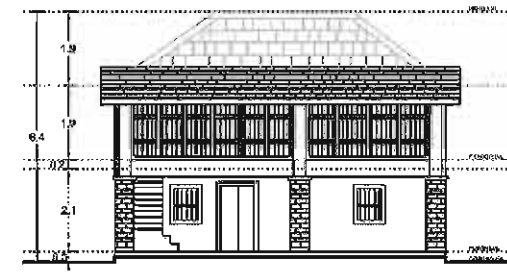
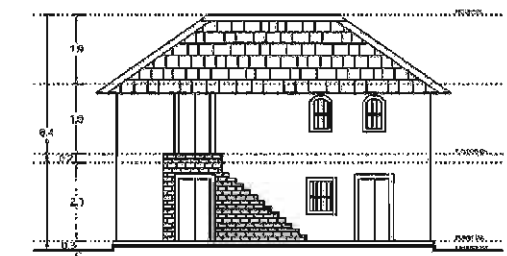
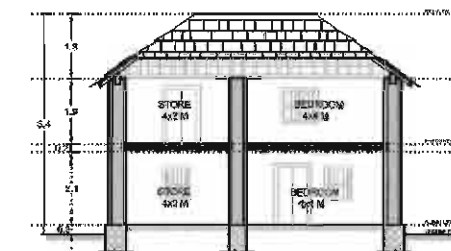
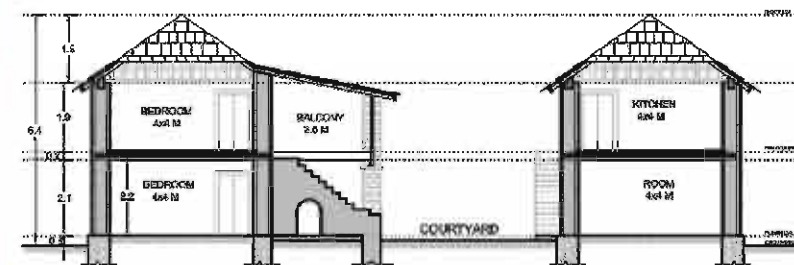
- Flooring** : Mud, cow dung, leaves, bamboo.
- Walling** : Sun dried adobe blocks, mud, cow dung Plaster.
- Foundation** : Stone and mud mortar.
- Roofing** : Bamboo, slates.

PHASES OF CONSTRUCTION:

- Initially the block of the house was built with no staircase access to the top floor in 1918.
- After this the staircase was added.
- Another block was added still further around 1950.
- Staircase of this block was added some years later.

ACTIVITIES:

- The courtyard of the house is used for house hold chores like drying of grains and washing of clothes and drying.
- The verandah of the house is extensively used for activities related to the house as shown in the picture.
- The kitchen is used for cooking, storage and for bathing.
- Visitors and the guests are received in the verandah.
- The store rooms are used for storing of grains and other house hold items.

**ELEVATION A****ELEVATION B****SECTION YY****SECTION XX'**

HOUSE NO: H- 19**OWNER** : Smt. Bisroo Devi**NO. OF RESIDENTS:**

Male - 1

Female - 2

Children – 3

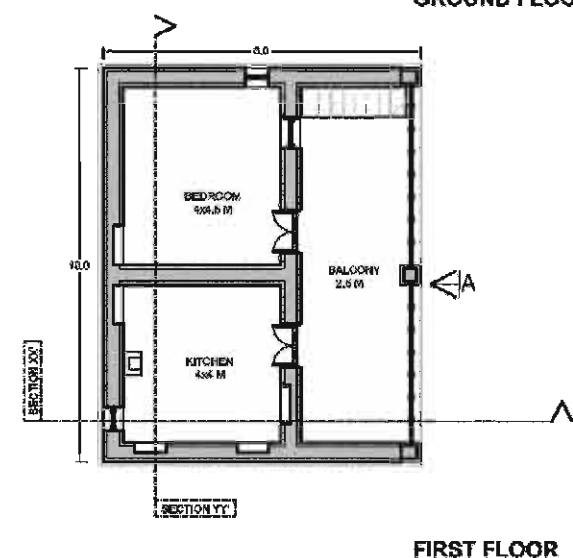
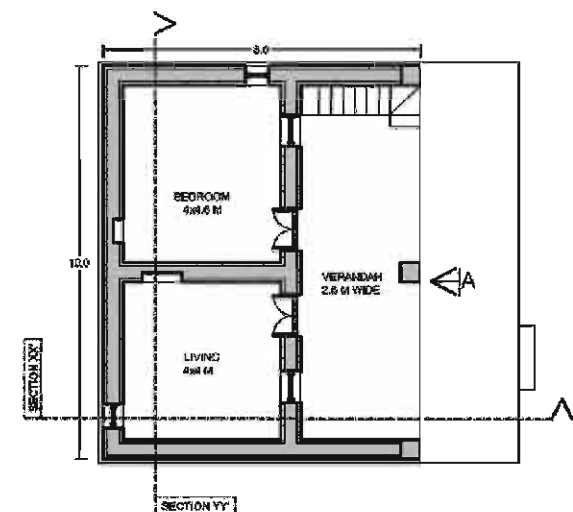
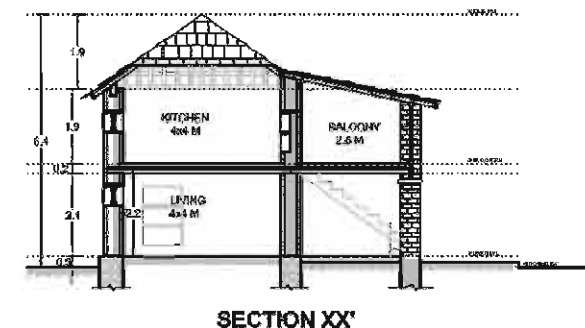
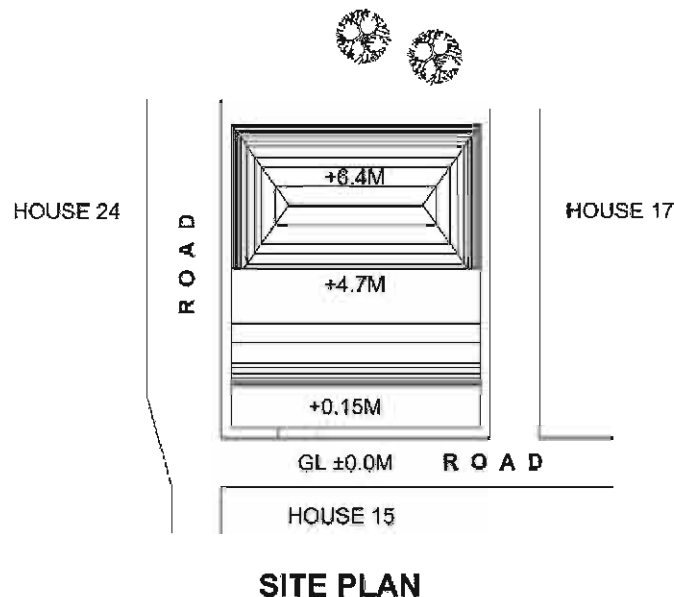
EDUCATIONAL QUALIFICATION:

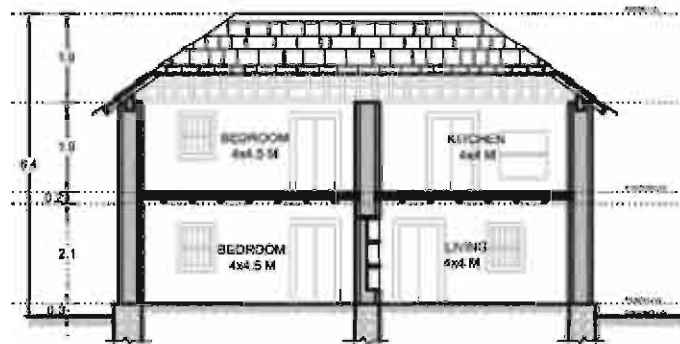
2 Member: 10 th

Children: Studying

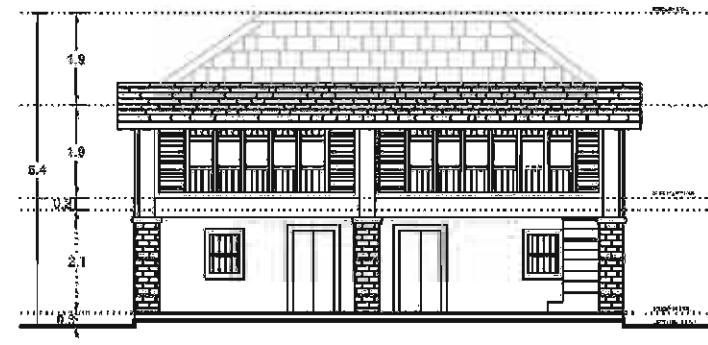
EMPLOYMENT: The only male member works as a worker in a factory.**RELIGION** : Hindu**CASTE:** Brahmin**YEAR OF CONSTRUCTION:** 1943.**CONDITION OF HOUSE:** Kaccha house.**DRAINAGE:** Drain water flows in the open**DRINKING WATER:** Tap water**SANITARY CONDITION:** Poor sanitary condition with no proper toilet.**PLANNING CONSIDERATION:**

- The house has a nuclear plan.
- There is no proper drainage.
- The cowshed is at a distance of about 100 m from the house.
- The color has predominance of blue & green.
- The house doesn't have any interesting feature.





SECTION YY'



ELEVATION A



IRON GIRDER RESTING ON THE STONE PILLAR



VIEW OF THE STAIRCASE

HOUSE NO: H- 13**OWNER** : Smt. Prem Devi**NO. OF RESIDENTS:**

Male - 1

Female - 2

Children -3

These are the residents of this house but originally the owner has four sons who do not live in the village but have other houses in the village.

EDUCATIONAL QUALIFICATION:

Owner - Under 10th

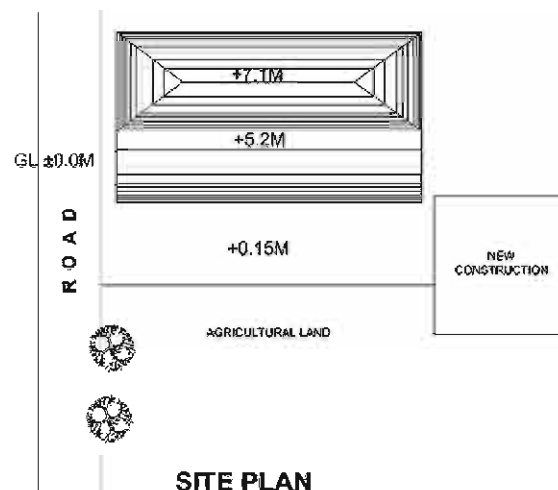
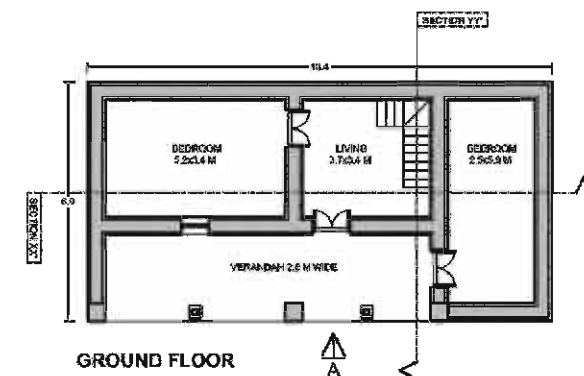
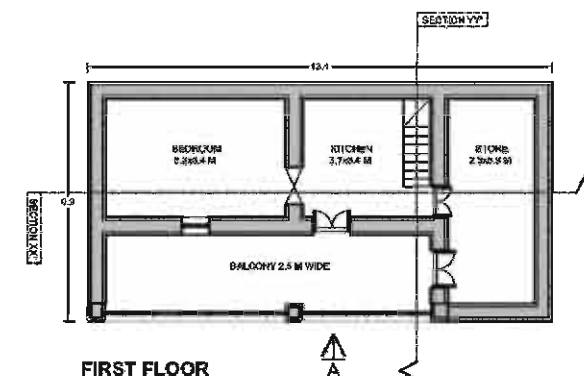
Children – studying

RELIGION : Hindu**CASTE** : Brahmin**EMPLOYMENT** : Self employed**YEAR OF CONSTRUCTION** : 1943**CONDITION OF HOUSE** : Kaccha**DRAINAGE** : Drain water flows into the fields**DRINKING WATER** : Tap water**SANITARY CONDITION** : Poor sanitation with no proper toilets.**PLANNING CONSIDERATION:**

- The plan of the house is linear.
- There is no proper drainage planned.
- No toilets were planned initially neither has been built till date.
- Cowshed is nearby at a distance of 10 m.

ACTIVITIES:

- Kitchen of the house is located in the top floor where cooking is carried out.
- The stone is used for storage of grains & other household items.
- Bedroom is used for resting purpose & for sleeping.
- Living & verandah are used for sitting purposes & for receiving guests.
- The courtyard of the house is used for carrying household chores & keeping of animals.

**ELEVATION A****GROUND FLOOR****FIRST FLOOR**

ELEVATIONAL FEATURES:

- The house shows predominance of green & white color.
- The elevation of the house bears a worn cut look to due to lack of maintenance.
- The supporting pillars show the use of pointing.

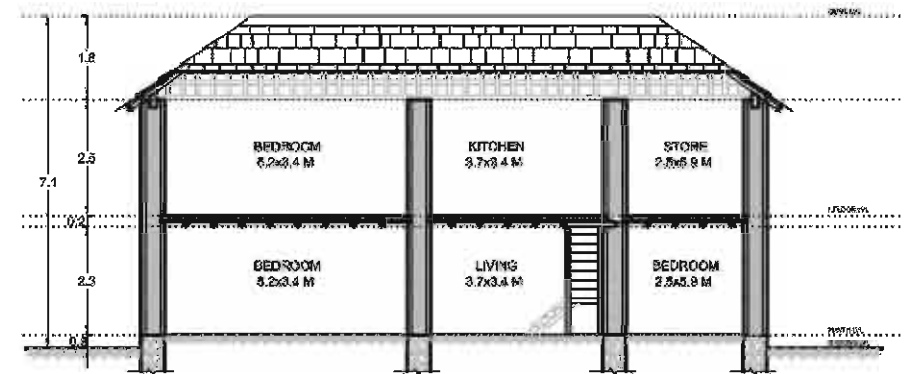
CONSTRUCTION MATERIALS:

Flooring : Mud, cow dung, leaves, bamboo

Walling : Sun dried adobe mud blocks, mud plaster

Foundation : Stone, Mud plaster

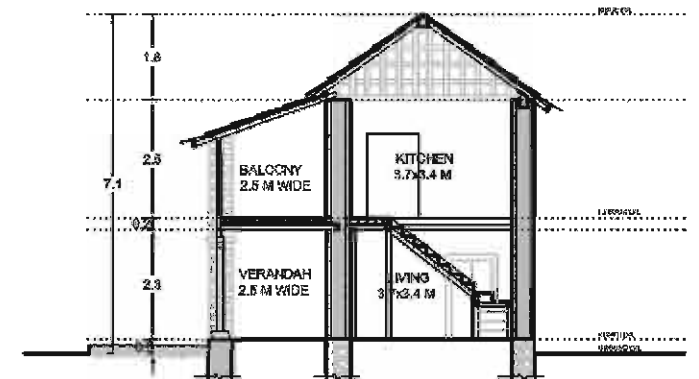
Roofing : Bamboo, Slate.



SECTION XX'



WOODEN BEAM RESTING ON THE STONE PILLAR



SECTION YY'

HOUSE NO: H- 24

OWNER : Owned by 3 families.

•Family – 1

OWNER : Mauzi Ram Sharma.

NO. OF RESIDENTS:

Male - 2

Female - 2

Children -2

EDUCATIONAL QUALIFICATION:

Under 10 - 1

10th - Rest (2+1)

•Family – 2

OWNER : Satish Kumar Sharma.

NO. OF RESIDENTS:

Male - 1

Female - 1

Children -2

EDUCATIONAL QUALIFICATION:

2 members: 10th pass

Children: Studying

• Family – 3

OWNER : Sh. Rajesh Kumar Sharma.

NO. OF RESIDENTS:

Male - 2

Female - 2

Children -2 + 2

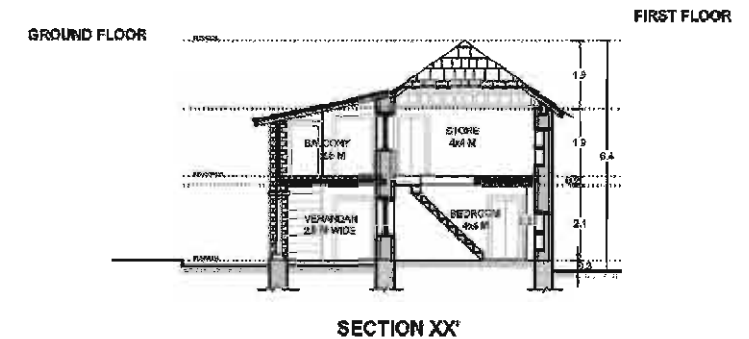
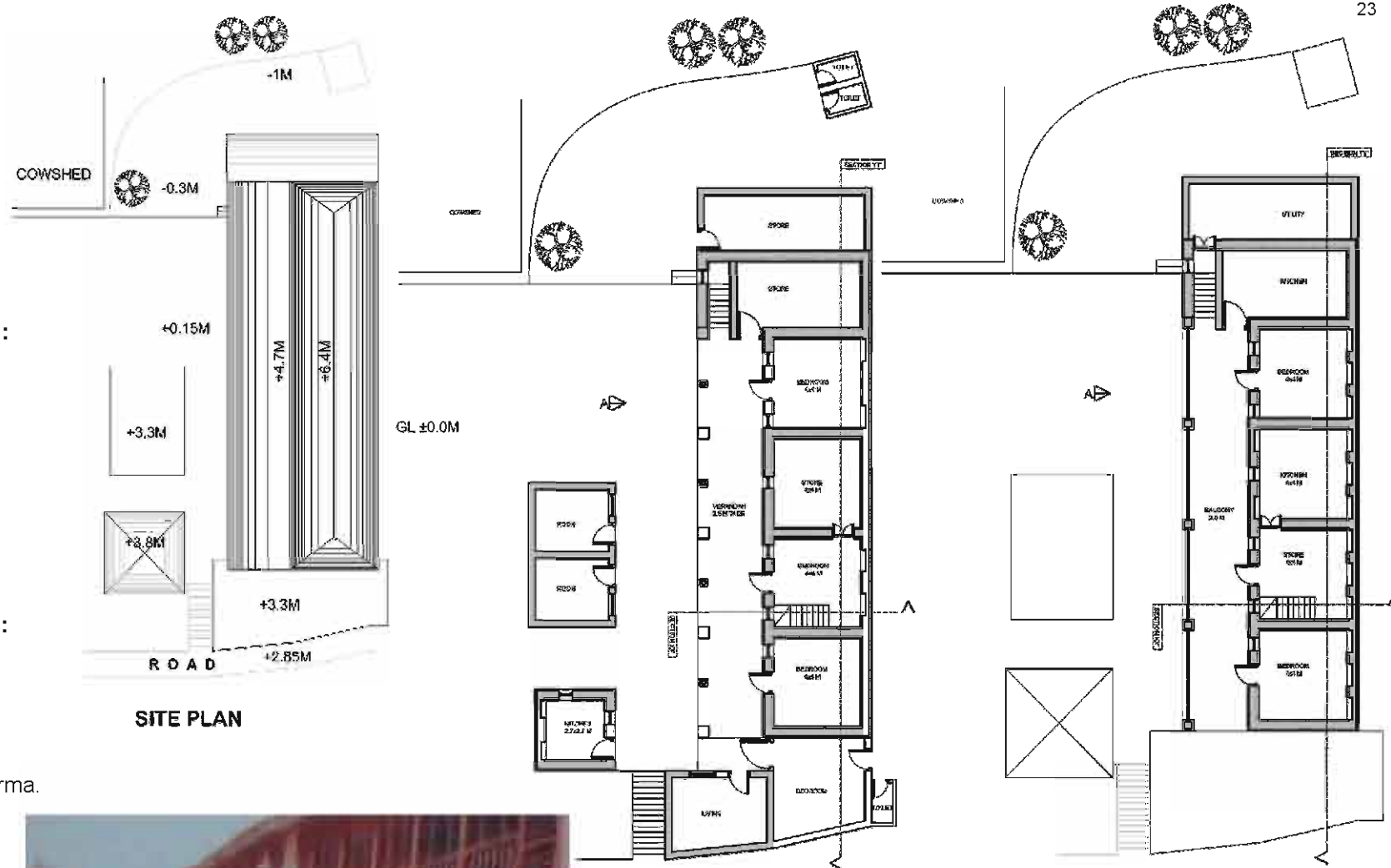
EDUCATIONAL QUALIFICATION:

4 members: 10th pass

Children: studying

RELIGION : Hindu

CASTE : Brahmin



YEAR OF CONSTRUCTION: 1963

CONDITION OF HOUSE: Semi Pakka

DRAINAGE: Poor

DRINKING WATER: Tap water

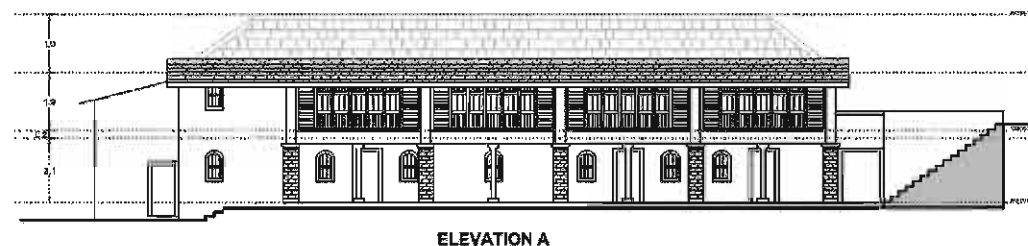
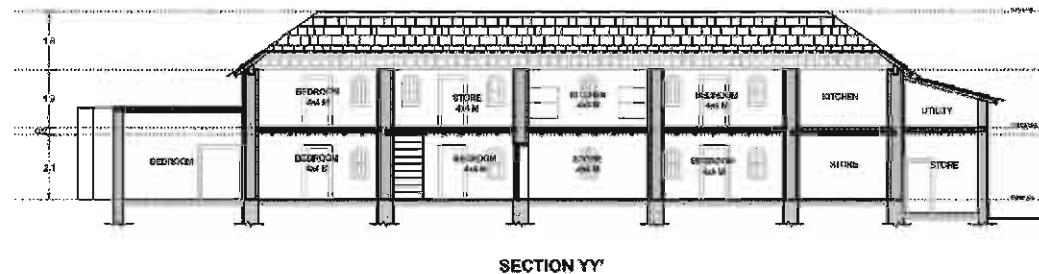
SANITARY CONDITION: Sanitation was good all the three families have their own toilets.

PLANNING CONSIDERATION:

- The house has a linear plan with a recent attachment in pucca.
- The house does not have proper drainage system.
- The toilets built are new & were not planned initially.
- All the three families have their cowsheds nearby.

ELEVATIONAL FEATURES:

- The house has predominance of yellow & brown.
- The house has good appearance.



Toilet Block



Typical Window



Lately Added Staircase

HOUSE NO: H- 11**OWNER :** Smt. Urvi Devi**NO. OF RESIDENTS:**

Two families occupy the house

Male - 2

Female - 2

Children – 3

EDUCATIONAL QUALIFICATION:Males : 10th passed

Children: Studying

RELIGION : Hindu**CASTE:** Brahmin**EMPLOYMENT:**

•Agriculture

•One male member working as peon.

YEAR OF CONSTRUCTION: 1965.**CONDITION OF HOUSE:**

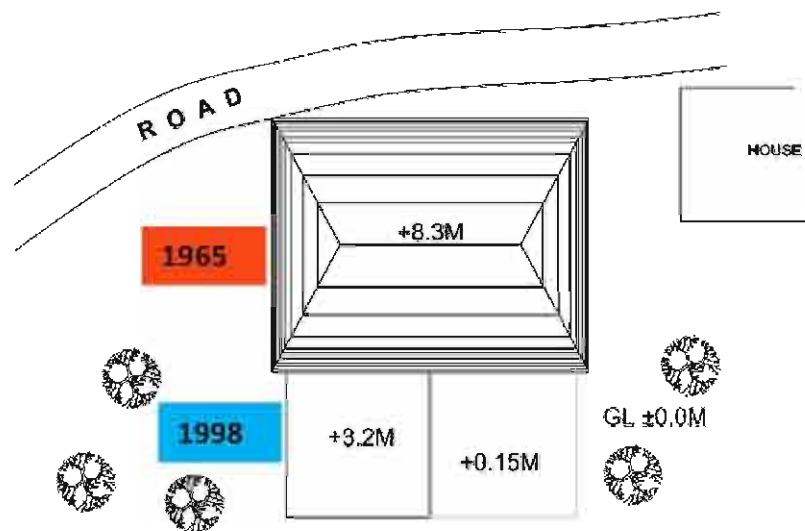
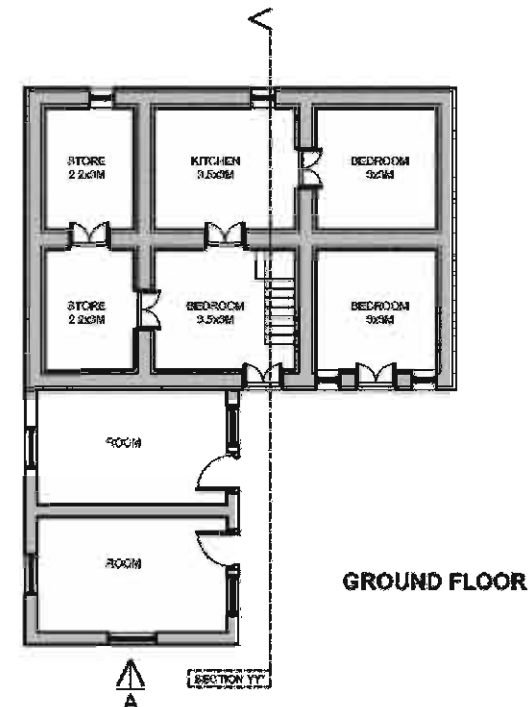
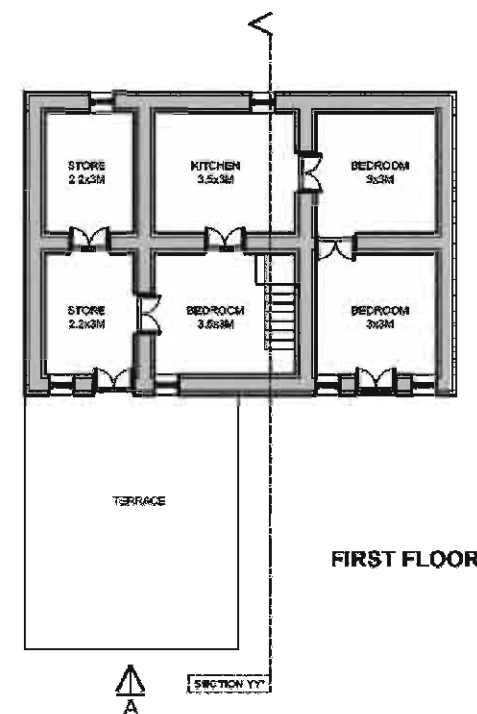
The house is Kaccha initially with a new two room construction which is Pakka.

DRAINAGE: Drain water flows in the open**DRINKING WATER:** Tap water**SANITARY CONDITION:** Not Good (Do not have a personal toilet)**PLANNING CONSIDERATION:**

- The house has nucleated planning with a single block.
- No proper drainage.
- No toilet planned.
- Cowshed far from house at a distance of 50 m.
- The house has no verandah or balcony.

PHASES OF CONSTRUCTION:

- The Kaccha portion was built around 43 years back ie is in 1965.
- The Pakka portion being added around 10 years back in 1998.

**SITE PLAN****GROUND FLOOR****FIRST FLOOR**

ELEVATIONAL FEATURES:

- The elevation shows predominance of white color with brown windows & door.
- The elevation is simple with no interesting element.
- The balcony and the verandah which make the elevation interesting in the other houses is missing here so it appears to be plain elevation with no ornamentation either.
- The Pakka construction added recently also does not any.

CONSTRUCTION MATERIALS:

Flooring: Mud, cow dung, leaves & bamboo.

Walling: Sun dried, adobe blocks, mud, cow dung plaster.

Roofing: Bamboo, slate.

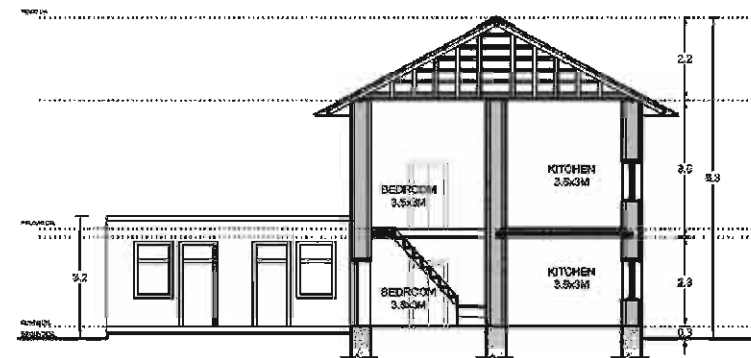
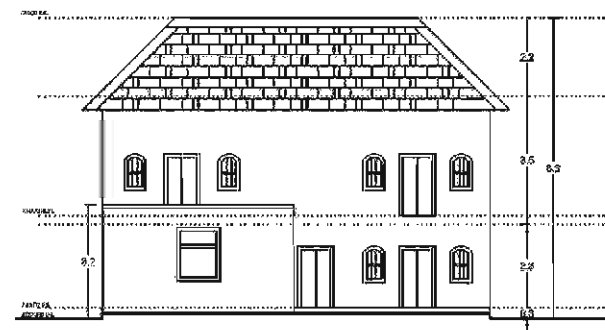
Foundation: Stone, mud, mortar of mud.

ACTIVITIES:

- The roof of the Pakka portion is used for drying of grains & clothes.
- The kitchen is used for cooking purpose and for washing of utensils & bathing by ladies.
- Guests are received in the Pakka portion of the house.
- Store rooms are used for storage of grains, household items & clothes etc.
- Bedrooms are used for resting & sleeping purpose.

INFERENCE:

- The house due to lack of verandah and the balcony does not have a very pleasing appearance.
- The Pakka portion is nicely embedded in the Kaccha portion & is not separated.

**SECTION YY'****ELEVATION A**

OWNER : Sh. Ratan Chand

NO. OF RESIDENTS:

Male - 2
Female - 1
Children - 2

EDUCATIONAL QUALIFICATION:

Owner - Under 10 th
One Male - 10th pass

RELIGION : Hindu

CASTE : Brahmin

EMPLOYMENT: One male member in Army Agriculture

YEAR OF CONSTRUCTION : 1965

CONDITION OF HOUSE : Semi Pakka (Floor plastered)

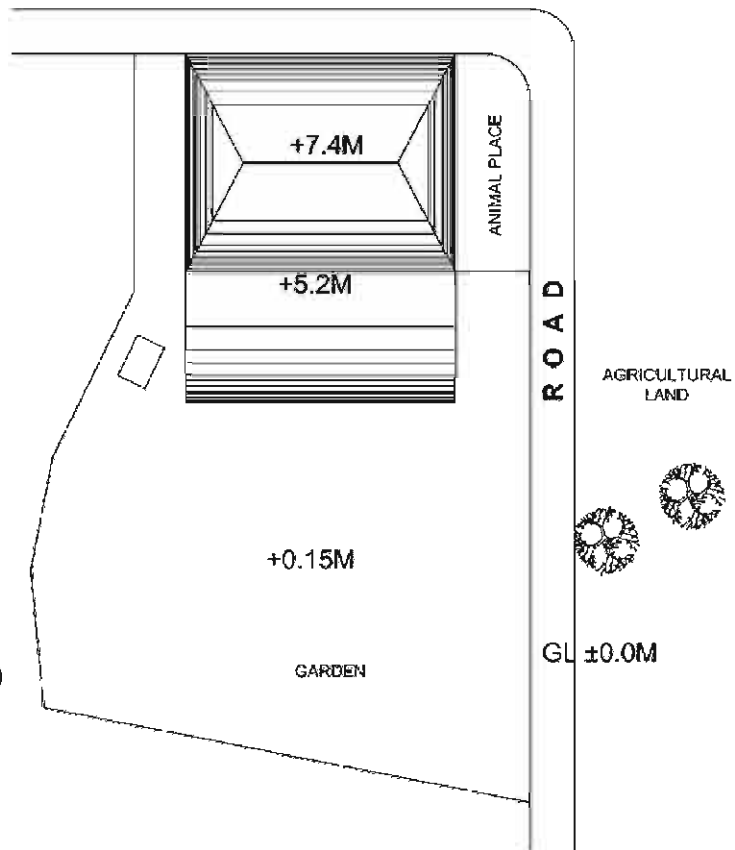
DRAINAGE : Drain water flows in the open

DRINKING WATER : Tap water

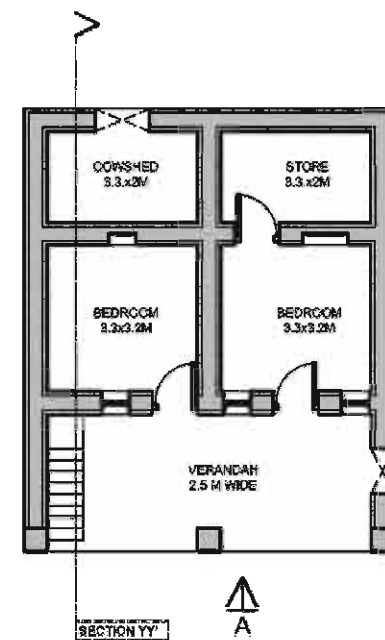
SANITARY CONDITION : Toilet added later

PLANNING CONSIDERATION :

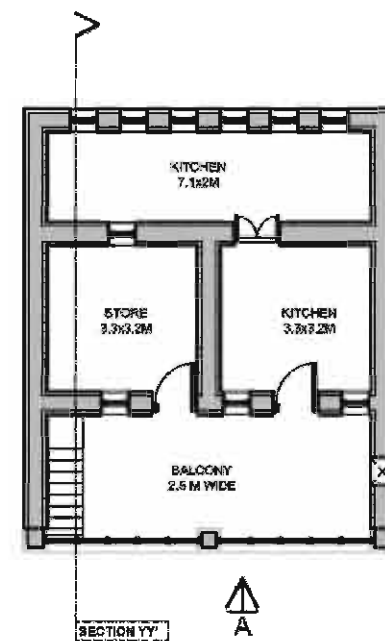
- Nuclear planning
 - No Proper Drainage and toilets added later.
 - Cowshed has been planned within the house
- With entry from rear side.



SITE PLAN



GROUND FLOOR



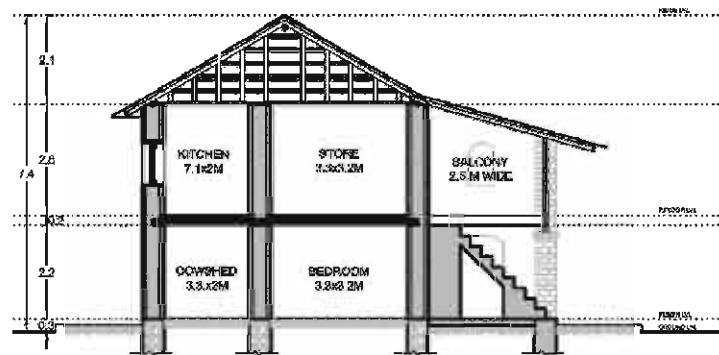
FIRST FLOOR

ELEVATIONAL FEATURES :

- The house has predominance of yellow and lime color
- The interesting element are the pillars in the verandah

INFERENCES :

- In this house cowshed is within the house and animals are neared adjacent to the house .Though this is convenient but not hygienic as animals attract Insects and harmful microorganism .

**SECTION YY'****ELEVATION A**

HOUSE NO: H- 15**OWNER** : Sh. Laxman Das**NO. OF RESIDENTS:**

Male - 1

Female - 1

Children - 2

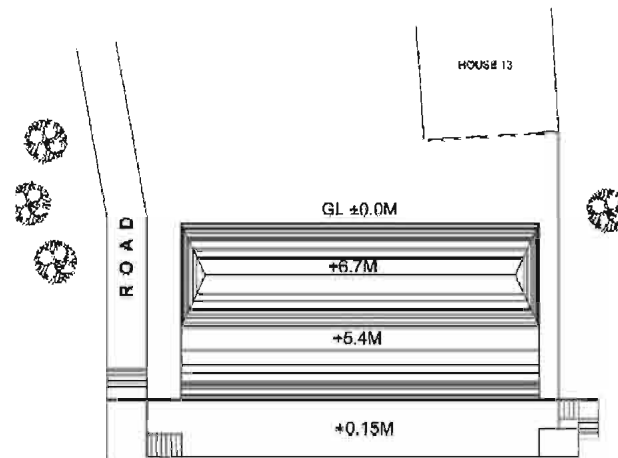
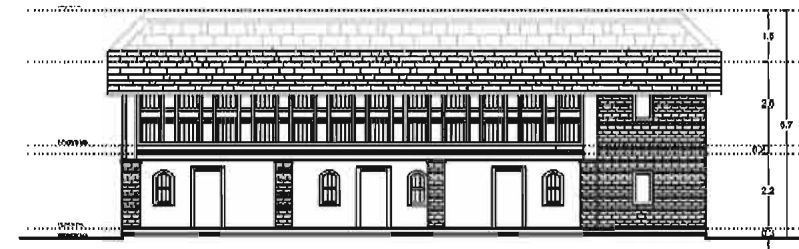
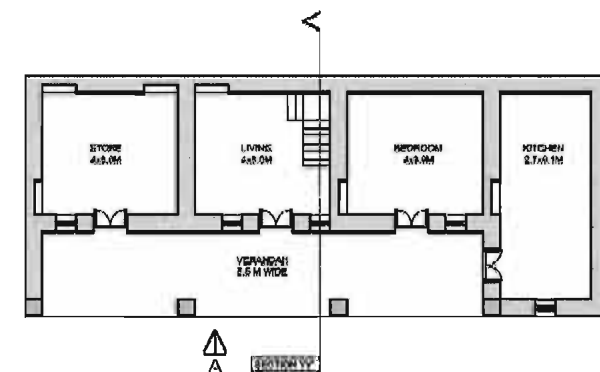
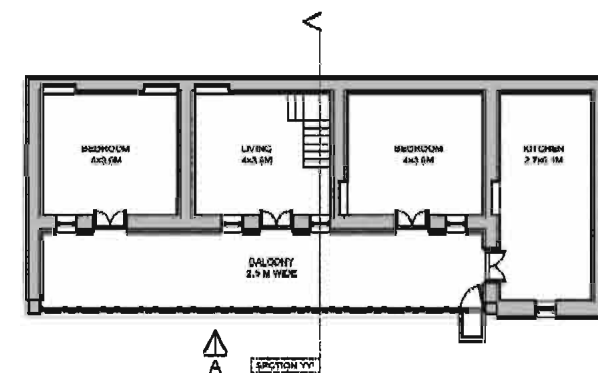
EDUCATIONAL QUALIFICATION:

Owner - 10+2 passed

Children - Studying

RELIGION : Hindu**CASTE** : Brahmin**EMPLOYMENT** : Owner peon in P.W.D**YEAR OF CONSTRUCTION** : 1968(40 yrs old)**CONDITION OF HOUSE** : Semi Pakka (Walls of stone up to lintel level and floors plastered)**DRAINAGE** : Drain water flows in the open**DRINKING WATER** : Tap water**SANITARY CONDITION** : Good (Have their own toilet recently constructed)**ACTIVITIES :**

- The courtyard of the house is used for house hold chores.
- The verandah as such is not extensively used and balcony above it used as circulation area.
- The Kitchen serves the purpose of cooking, washing utensils and for bathing by ladies. Men usually use the courtyard for bathing.
- Guests and visitors are received in the Living Room.
- Stone room serves for storing of food grains and house hold items and also daily use items.

**SITE PLAN****ELEVATION A****GROUND FLOOR****FIRST FLOOR**

PLANNING CONSTRUCTION :

- Linear planning along centre courtyard.
- No proper drainage.
- No toilets planned initially .
- Cowshed near to the house approximately 7.5 M.
- Stone used till lintel level.

ELEVATIONAL FEATURES :

- Use of exposed stone masonry in the walls of ground floor.
- Windows decorated with use of arches.
- Supporting pillars show false exposed brick work with simple base and capital .
- Floor decorated with floral pattern in white cement.

CONSTRUCTION MATERIAL :

Flooring : Cement, mud, cow dung, leaves and bamboo.

Walling : Stone (ashlars), sun dried adobe blocks, mud and cow dung plaster.

Roofing : Bamboo, slate

Foundation : Stone, mud mortar

INFERENCE :

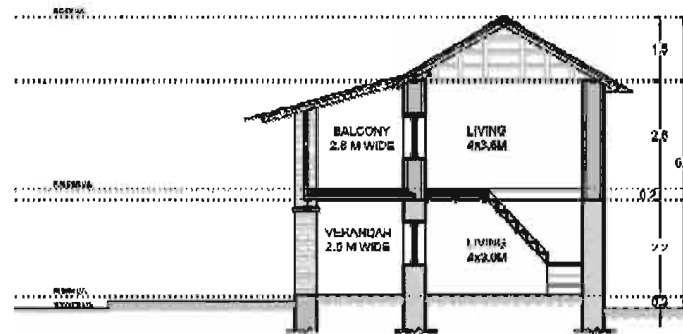
- The use of stone in the walls has reduced the investment both in terms of cost and labour for maintenance .
- Intelligent use of arches provide interesting appearance apart from structural strength to the structure.



Iron Girders Resting on the Stone Pillar



Window with the Exposed Arch



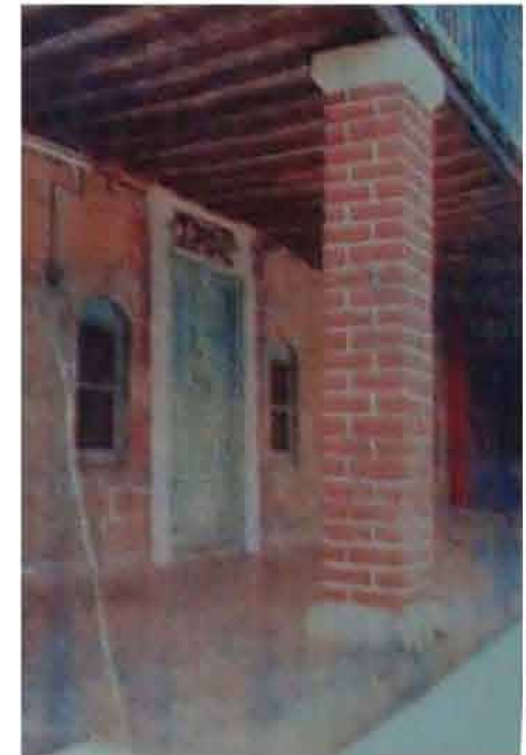
SECTION YY'



Change in materials causing cracks in the wall



Wooden Hangers Embedded in the wall



Exposed Brickwork in Pillars

HOUSE NO: H- 28**OWNER :** Smt.Gita Devi**NO. OF RESIDENTS:**

Female - 1+2 (Do not live here)

Male - 2 (Do not live here)

EDUCATIONAL QUALIFICATION:

Owner - Under 10th

Male - Graduates

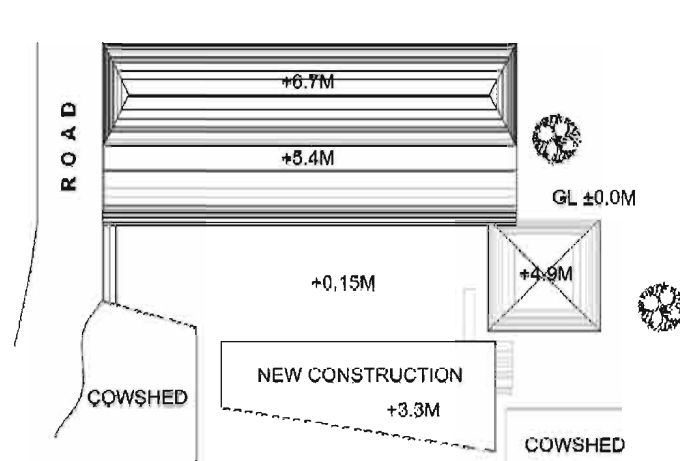
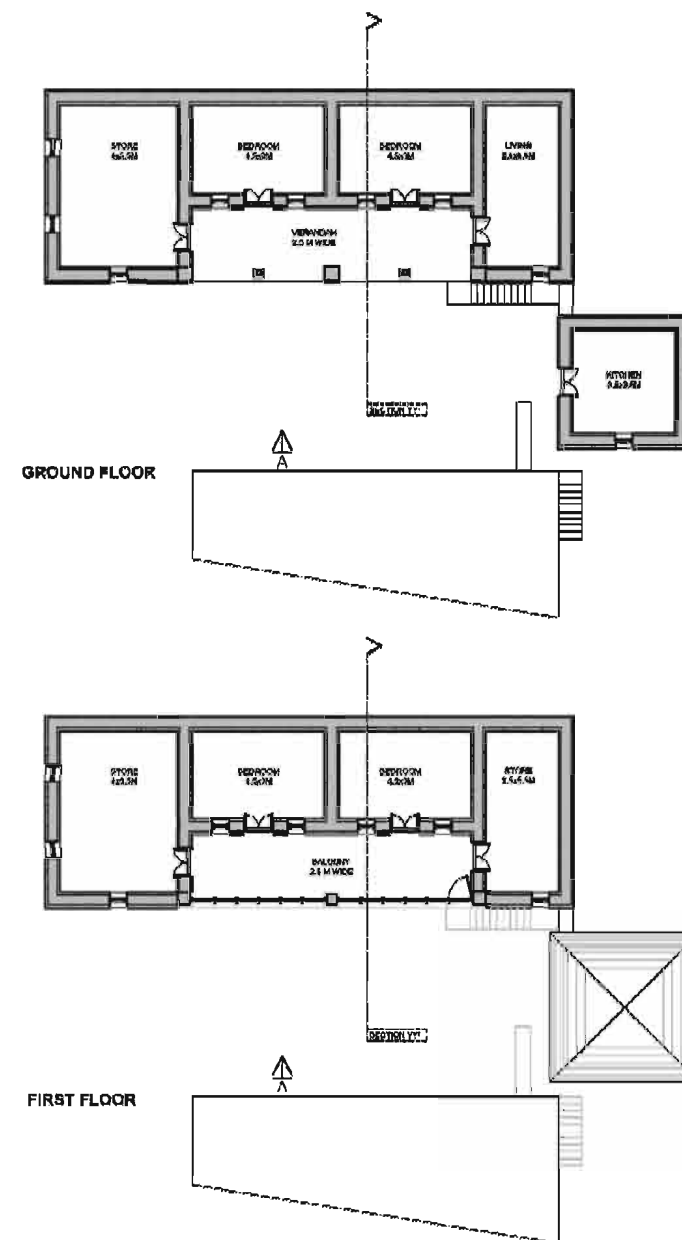
RELIGION : Hindu**CASTE :** Brahmin**EMPLOYMENT :**

•Both sons govt. employers

•Agriculture

YEAR OF CONSTRUCTION : 1971**CONDITION OF HOUSE :** Kaccha with Pakka Kitchen**DRAINAGE :** Drain water flows in the open**DRINKING WATER :** Tap water**SANITARY CONDITION :** Newly constructed toilet in the Pakka house constructed in 1990**PLANNING CONSIDERATION :**

- The house has a linear plan along the courtyard.
- The kitchen of the house is external. Initially it was Kaccha but has been rebuilt in brick and concrete.
- The staircase to top floor is external and the excess is from courtyard.
- The living room has also built recently, initially it was Kaccha room like the other part.
- The cowshed is about 10M from the house.

**SITE PLAN**

ACTIVITIES:

- Since the house is occupied by a single occupant it is not much used. The only room used by the occupant are the kitchen and living room.
- The living room is used for receiving guests and for resting purpose.
- The courtyard is used for other household chores.

ELEVATION:

- The house has predominance of yellow color with little amount of green color.
- The appearance is interesting but is not kept well.
- The house has external steep staircase without any external support.
- Sloping roof at different levels make it more interesting.

CONSTRUCTIONAL MATERIAL:

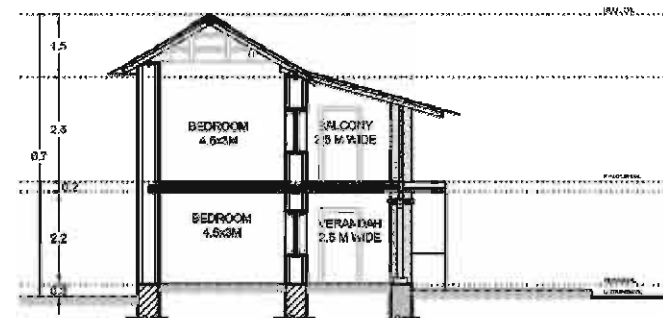
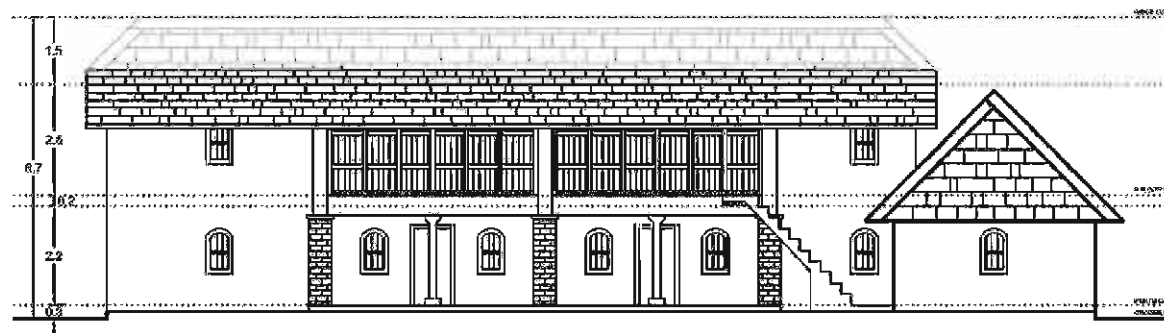
Flooring: concrete, mud, leaves, and bamboo.

Walling: sundried adobe blocks, mud, cow dung plaster.

Foundation: slate and bamboo.

INFERENCE:

The house has interesting capital which is carved and has flower pots attached or built with the base of pillar.

**SECTION YY'****ELEVATION A****Flower Bed With The column****Wooden Pillar Used to support the slab above****Bamboo Rafters Extended to support the cantilevered landing of the staircase**

HOUSE NO : H-21

OWNER :Two families occupy the house.

•Family-1

Owner: Smt Vidya Devi

No. of residents:

Male:2

Female: 3

Children: 3

Educational background:

Male members: 10th passed

One female member: graduate

Employment:1.own the shop
2. Agriculture

•Family-2

Owner: sh .Kanshi Ram

No. of residents:

Male:4

Female:4

Children:5

Educational Qualification:

10th pass : all except 2

Children : studying

Employment:

•Self Employed

•Agriculture.

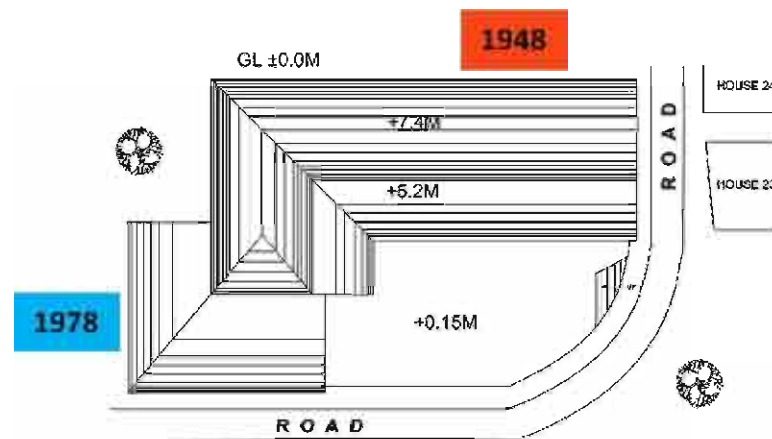
YEAR OF CONSTRUCTION: family-1 : 1948
Family-2 : 1978

CONDITION OF HOUSE: Semi Pakka

DRINKING WATER: Tap water

DRAINAGE: Poor with drain water flowing in the open

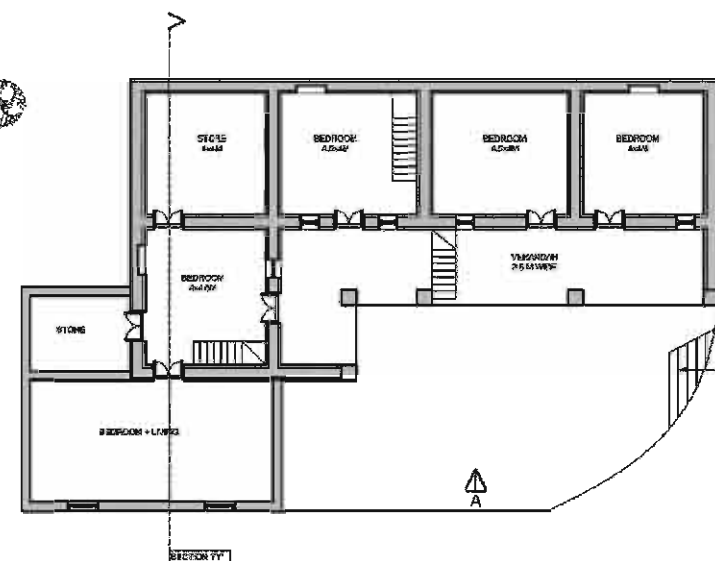
SANITARY CONDITION: Family one does not have a toilet. Family-2 have built the toilet recently.



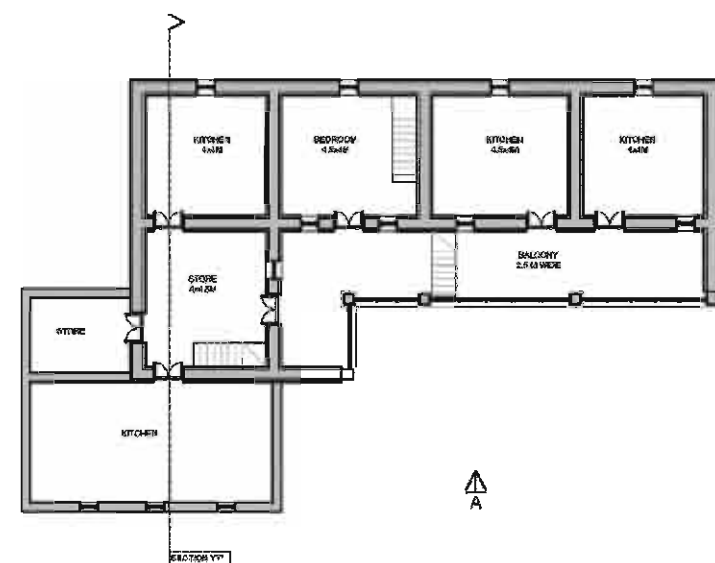
SITE PLAN



A lady member washing clothes and an elderly woman resting in the sun.



GROUND FLOOR



FIRST FLOOR

PLANING CONSIDERATION:

- The house has a L-shaped planning.
- There is no proper drainage with drain water flowing in the open.
- There was no initially planning for toilet but now one family has a newly built toilet but the other does not.
- The cowshed of one family is at a distance of 300M. while one family does not have any cowshed

ELEVATIONAL FEATURES:

- The elevation has predominance of blue and white color.
- The overall appearance of the house is good with is well maintained.
- The supporting pillars of the house are interesting.

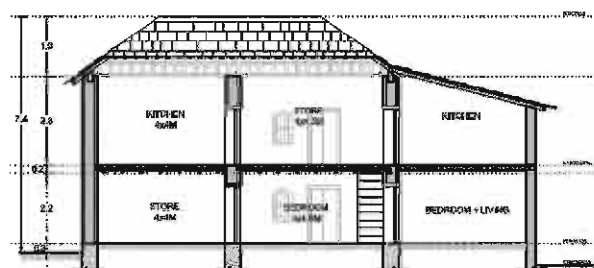
CONSTRUCTION MATERIAL:

Flooring: cow dung , Leaves, mud , bamboo
 Walling : mud ,mud & cow dung plaster,
 sun dried mud adobe blocks.

Foundation : stone, mud, mud mortar.



ELEVATION A



SECTION YY



A detailed picture showing the resting of roof on the outer cover of the balcony & The interior view of the washing area of the kitchen.

HOUSE NO: H- 20**OWNER** : Sh. Romi Das**NO. OF RESIDENTS:**

Male - 1

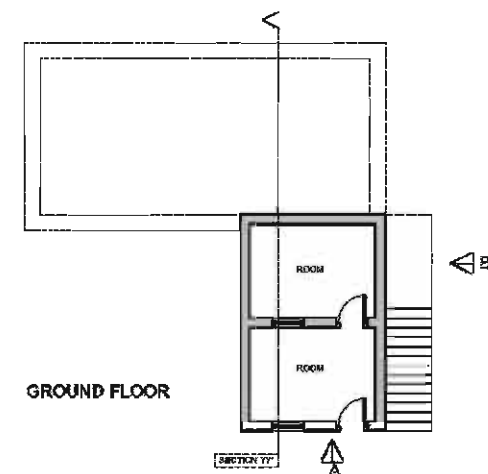
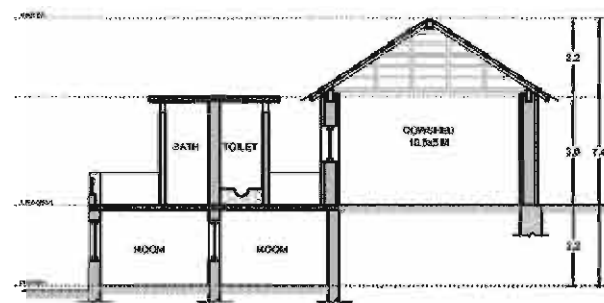
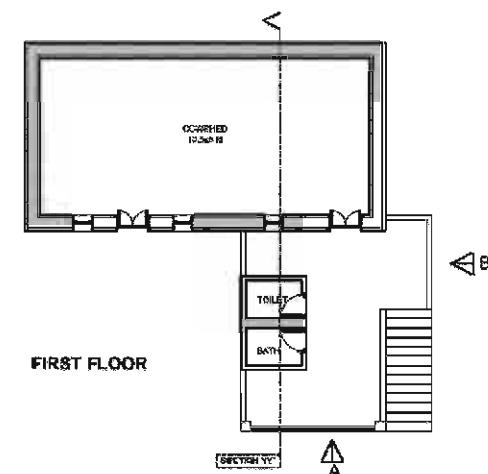
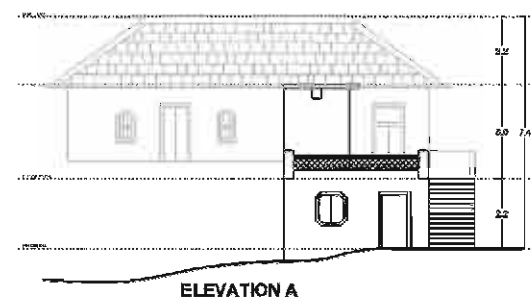
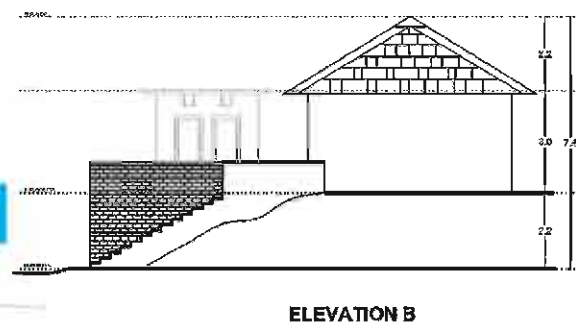
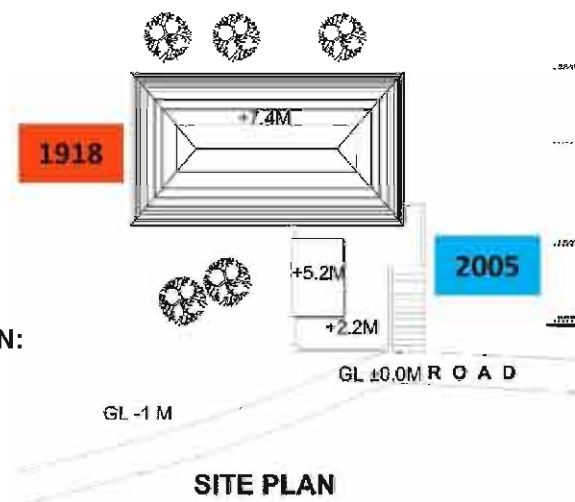
Female - 1

EDUCATIONAL QUALIFICATION:Male - 10thFemale - Under 10th**RELIGION** : Hindu**CASTE** : Brahmin**EMPLOYMENT** : Male member works as a daily wage earner**YEAR OF CONSTRUCTION** : 1918**CONDITION OF HOUSE** : Pakka**DRAINAGE** : Good Drainage, water goes into safe tank**DRINKING WATER** : Tap water**SANITARY CONDITION** : Sanitation is good with a separate toilet and bath.**PLANNING CONSIDERATIONS**

•The old house was the portion which is now cowshed but due to a recent Pakka portion constructed, the initial house has been converted into cowshed.

ELEVATIONAL FEATURES

•The elevations of the house is not so appealing with most of the portion of the cowshed plaster is damaged in rains.

**SECTION YY'**

House Interiors in General



Bedroom Interior



Balcony Window



Wall mounted Wooden Hangers in Verandah



Kitchen Interior



Wooden retrofitting for roof

COWSHED NO : C-21

OWNER : Sh. Kanshi Ram

NO. OF ANIMALS:

Buffalo: 1

Ox: 2

Goat: 1

YEAR OF CONSTRUCTION:

1989(19 years old)

CONDITION OF COWSHED:

Good and well kept.

DRAINAGE: Drain water flows in to the field.

PLANNING CONSIDERATIONS:

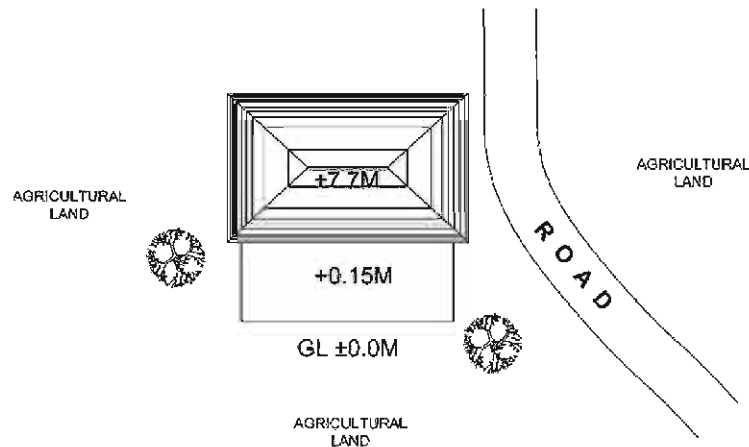
- The cow shed has two rooms one in which all the animals are kept.
- In the other room fodder and agricultural equipments are kept.
- On the first floor in both the rooms fodder for animals is kept.
- Outside in the courtyard space is provided for water storage and cow dung treatment.

INFERENCE:

- The cow shed is sufficient to contain all the animals.
- The best feature is scope has been provided for extension in future.
- Ladder is used to access the top floor as no staircase is present.



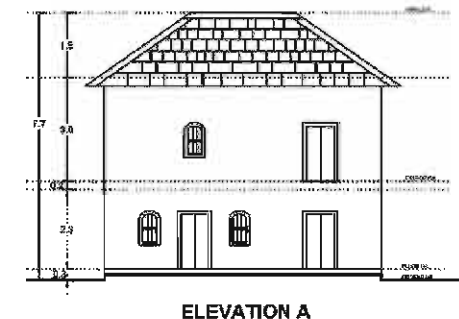
An internal view showing storage space.



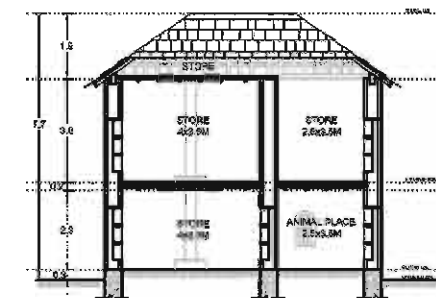
SITE PLAN



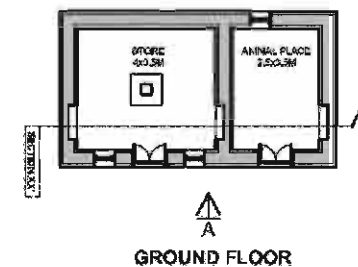
An external view showing doors and windows.



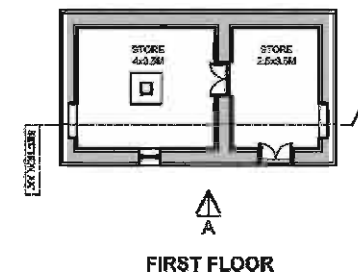
ELEVATION A



SECTION XX'



GROUND FLOOR



FIRST FLOOR

PUBLIC BUILDINGS

Primary School (P1):

A Government School services educational facilities up to 8th standards and 25-30 students are there in each class.

Inferences:

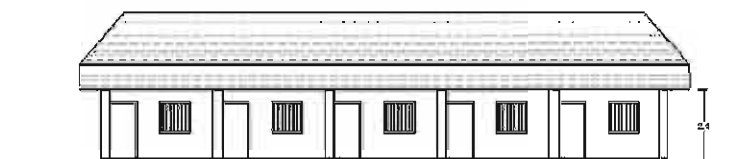
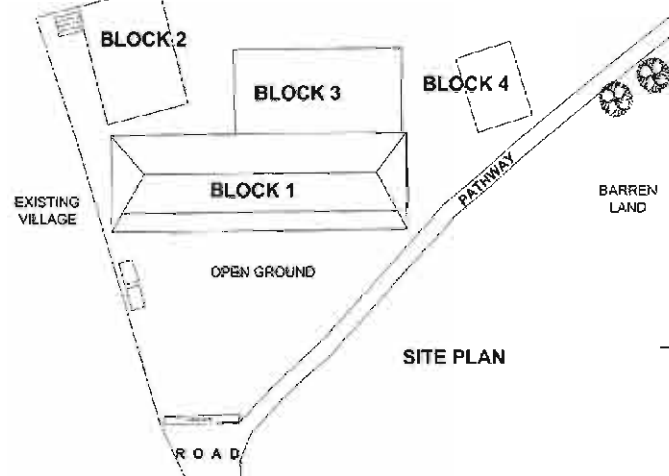
- No recreational facilities for children and no playground is provided for the children.
- Deficiency of classrooms in school which subjects students to take lectures in open areas.

Year of Construction 2005

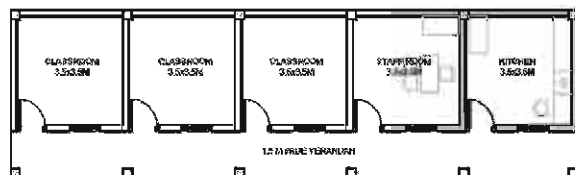
Location: Near the Hilltop

Construction Materials: Brick Wall with concrete Columns

Built up area =295 Sqm

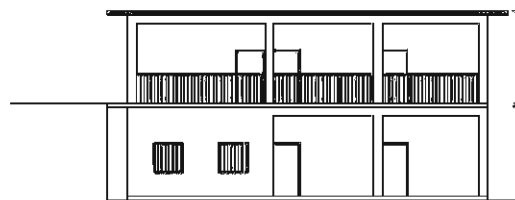


ELEVATION

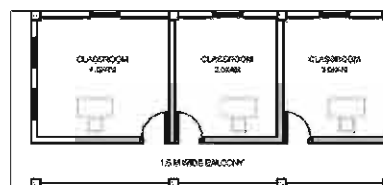


PLAN

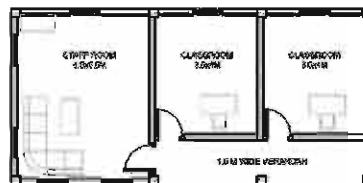
BLOCK 1



ELEVATION

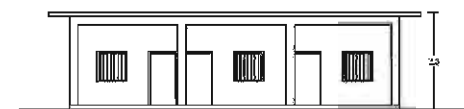


FIRST FLOOR

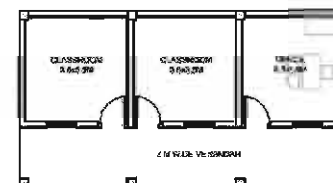


GROUND FLOOR

BLOCK 2

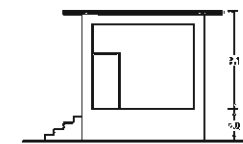


ELEVATION

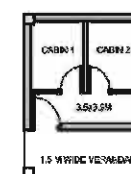


PLAN

BLOCK 3



ELEVATION



PLAN

BLOCK 4

Panchayat and Anganbadi (P2):

Observation:

- Panchayat and Anganbadi functions in same building.
- The building comprises of a common discussion room along with Head office of Panchayat and Anganbadi.

Inference:

- Panchayat and Anganbadi should have different buildings because both perform different operations.
- No recreation room is provided for the kids coming to Anganbadi.



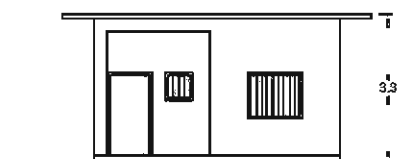
Single Storey Building

Year of Construction 2001

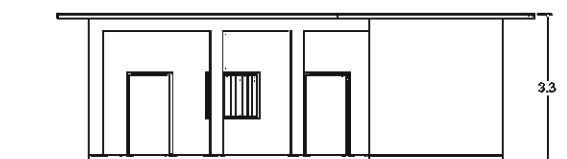
Location: South West from Hilltop

Construction Materials: Brick Wall with concrete Columns

Built up area =84.5 Sqm



ELEVATION



ELEVATION

Dispensary (P3):

Observation:

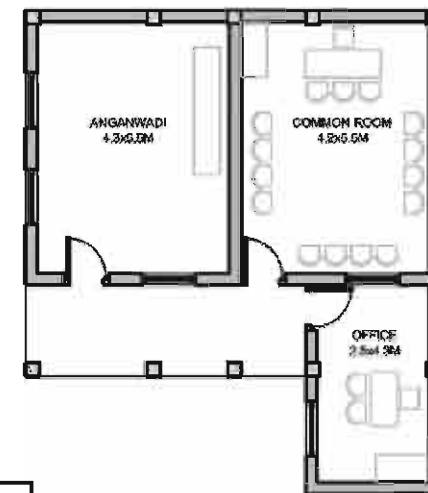
- Open for 24X7 for the villagers & Only handles minor cases and first aids
- Major cases are referred to Zonal Hospital Hamirpur.

Inferences:

- Ambulance facility should be there which is lacking in this PHC.
- One compounder or nurse facility is needed .
- Female and child care unit is not here.



PLAN



PLAN

Single Storey Building

Year of Construction 2002

Location: South West from Hilltop

Construction Materials: Brick Wall with concrete Columns

Built up area =30.15 Sqm



RELIGIOUS BUILDINGS

Observations:

- The village is having only Hindu community so only Temples are found out in whole village.
- Two major temples are found in the village ,one on the hill top and other is accessible from the main road.
- Hilltop temple only comprises of Deity room and a covered seating / Parikrama area.
- Lower temple consists of stores and Pujari room along with the Deity room on first floor.
- Lower temple is built in year 2002.

Private Temple T1

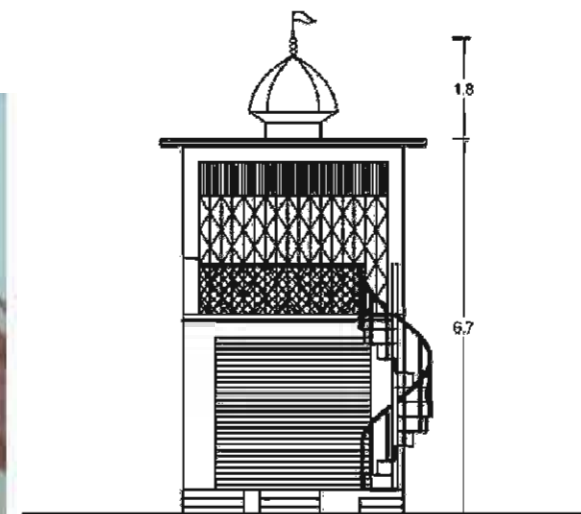
4 Storey Building

Year of Construction 2002

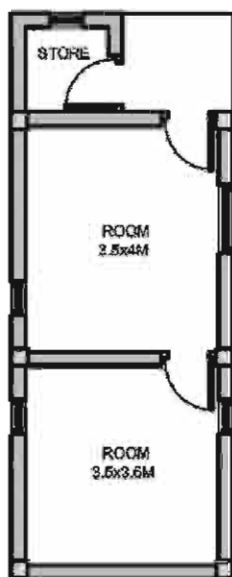
Location: South West from Hilltop

Construction Materials: Brick Wall with concrete Columns

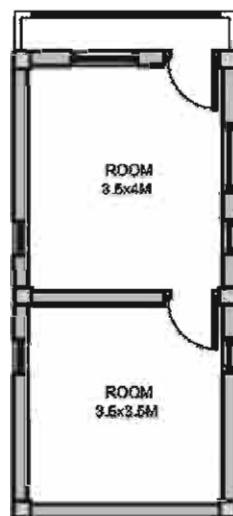
Built up area =150 Sqm



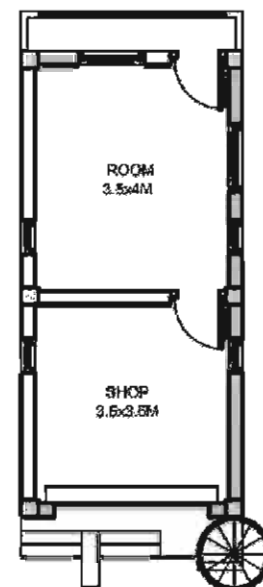
ELEVATION



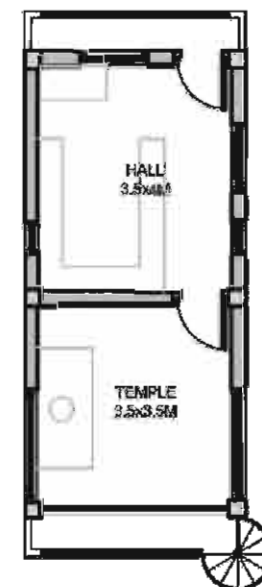
GROUND FLOOR



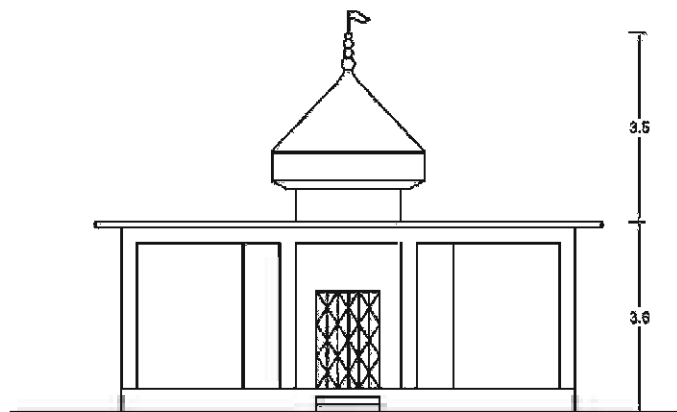
FIRST FLOOR



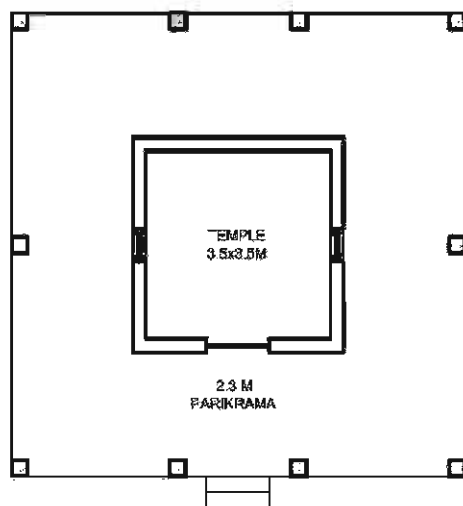
SECOND FLOOR



THIRD FLOOR



ELEVATION



PLAN



Hilltop Community Temple T2

Single Storey Structure

Year of Construction 2004

Location: On Hilltop

Construction Materials: Brick Wall with concrete Columns

Built up area =75.6 Sqm

CONSTRUCTION METHODS IN GENERAL

After the complete study of all the houses of the village it was found that all the houses have the same constructional details which may differ at some places like the use of materials but they have almost the same details which are as follows:

FOUNDATION

While laying the foundation of house, the earth is dug up till a hard strata is found below the surface of earth. The digging for search of hard strata can go to the depth of 9 feet or 3m approximately. Hard Strata ranges between 6 feet to 20 feet. If still no hard surface is found, the surface is made hard by use of stones. On this hard surface then the foundation surface is laid using mud brick mortar. The use of stone for the foundation goes till plinth level after which mud walls start.

WALL

- The walls of these houses are made up of adobe blocks of mud which have a nominal size of 320x160x120mm.
- These adobe blocks are made up of mud, cow dung, some reinforcing material like hay or jute and pebbles.
- The adobe blocks are made in moulds of wood and after they have been cast they are left in the sun for drying.
- The wall thickness is 500mm and the adobe blocks used for their construction and are laid using mud plaster.
- The mud plaster is made up of mud, cow dung and use of reinforcing material.
- Cupboard for storage are set in the these walls with a depth of 250mm.

Slab:

- The slab of the first floor is usually 4" that is 162mm thick.
- To support this slab in the front elevation usually girders are provided which may be of iron or wood.
- Where wooden beams are used generally additional wooden supports are provided in between the stone pillars
- First floor slab rests on the wooden/bamboo rafters which are firstly embedded in to the wall
- On these rafters bamboo splits are laid and on these sheets further Khajoor leaves / Jute Bag are kept for mud cow dung mortar (in the ratio 3:1).
- After it is leveled, cow dung paste is applied on top.



Boulder and Mud Foundation



Sun Dried Mud Brick



Iron Girder Used Under the Balcony Slab



Rafters(Wood at fixed distance and bamboo as common rafter) Resting on Iron Girder



Wooden Beam Used Under the Balcony Slab With Intermediate Wooden Pillars



Rafters(Wood & Bamboo Alternatively) Resting on Wooden Beam

ROOF

- The roof found in all the houses is made up of slate and bamboo (may be replaced by other kind of wood).
- For laying of roof a grid of bamboo is made the spacing between the members of the grid varies from 300-450 mm.
- The horizontal and vertical members of the grid are nailed together and then the grid is rested upon the walls.
- To this grid the slates are then nailed.



Wall Piece made of 1/4th Tree Trunk



Bamboo fixed for the Cooking Wood Storage/ Attic



Bamboo Rafters going into the Wall



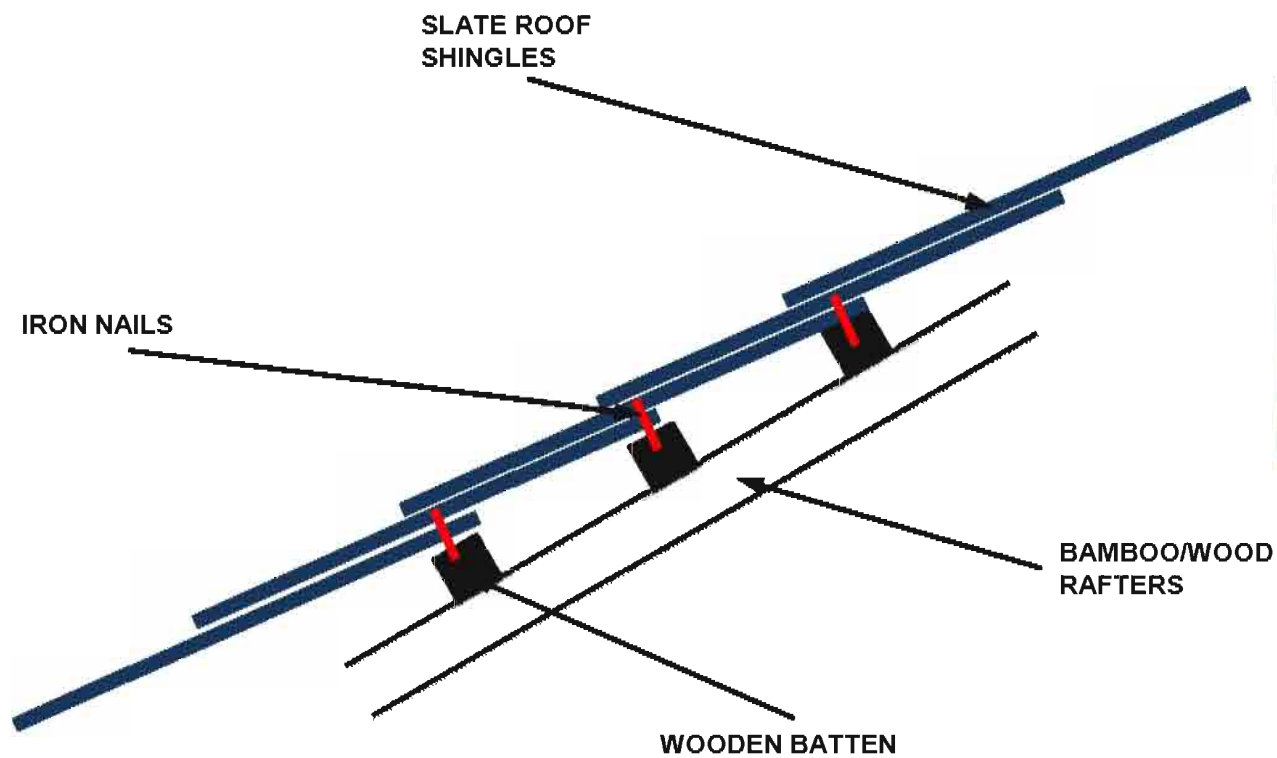
Main Rafter and Common Rafter Joinery on the Roof Hip



Extra Support for the Ridge on Internal Wall



Rafter and Batten Grid Under The Slate Shingles

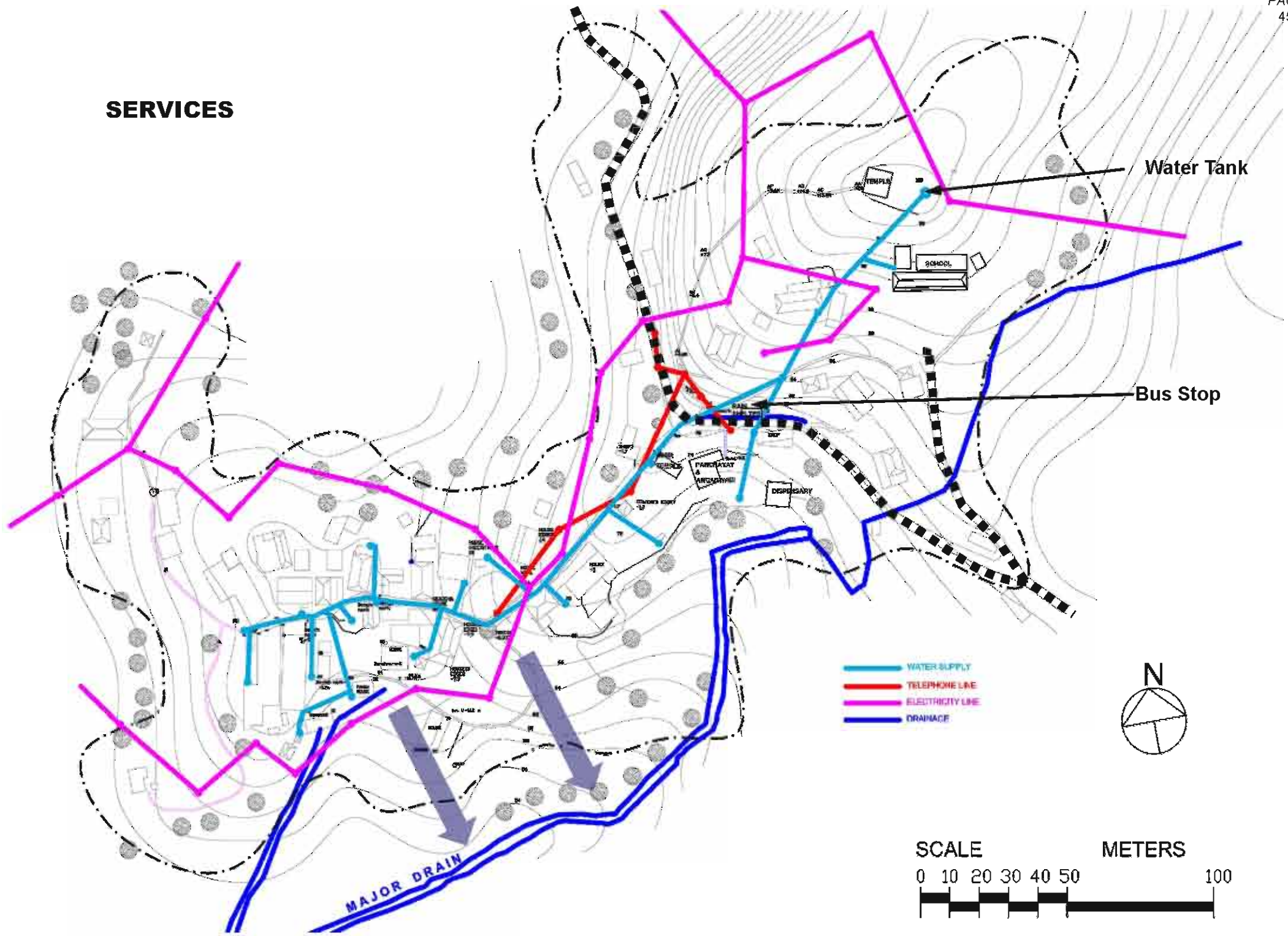


KHYAH VILLAGE SLATE ROOFS



TYPICAL SLATE SHINGLES ARRANGEMENT

SERVICES



Electricity Supply:

Observation:

- Electricity supply reaches to every house in proper manner.
- There is no provision of street lights.

Inferences:

- Street lights should be there in the village.



Water Supply:

Observation:

- Hand pumps are rare in village.
- Whole water supply is done by a single tank of dia 4.14 m placed on hill top near the Temple.
- Water supply pipes run along with the pathways and above the ground.
- For every few clusters there is one tap is provided as per the ease of access.

Inferences:

- Water supply pipes should be underground as per to avoid accidents.
- Water supply pipes needed to increase the dia near the water tank to reduce down the no. of pipes coming down.



Drainage Facility:

Observation:

- The drains of houses goes along with the pathways along the slope and dumps in the Nalah downside of the village.
- The toilets are built over the soak pits.

Inferences:

- Proper drains should be there along the pathways to avoid water clogging.
- The drains should be partially covered so as to work also as storm water drains as well as grey water drains down to the Nalah.



Water Tank

Year of Construction 1991

Location: On Hilltop

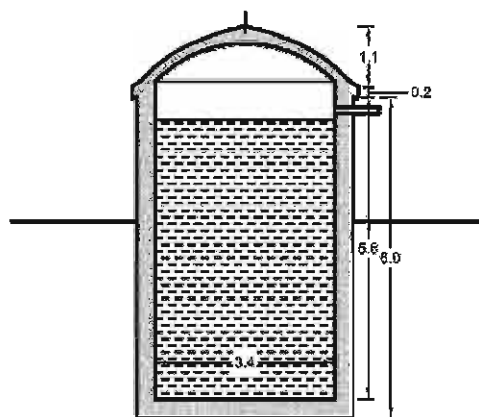
Construction Materials: R.C.C.

Built up area =13.2 Sqm

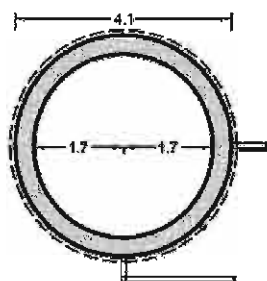
Outer Radius=2.05m

Height=5.6m

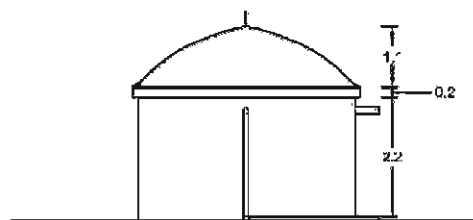
Volume=57.5 cum



SECTION



PLAN



ELEVATION



Rain Shelter(Bus Stop) P-4

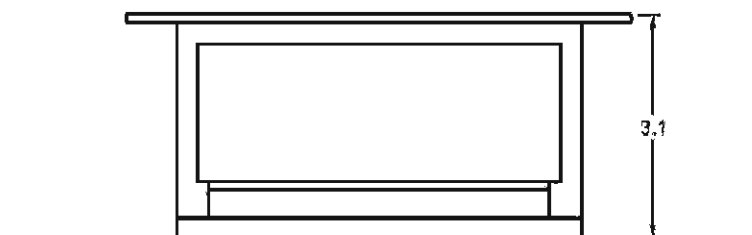
Single Storey Structure

Year of Construction 2004

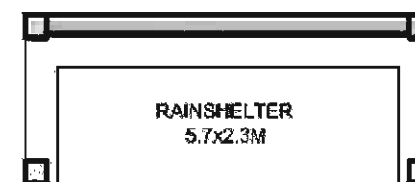
Location: South West from Hilltop

Construction Materials: Brick Wall with concrete Columns

Built up area =15.1 Sqm



ELEVATION



PLAN

ROAD NETWORK AND PATHWAYS

- Road passes through the central part of the village.
- It connects the village to Hamirpur town which is at a distance of 10 km.
- The houses are linearly arranged along the main pathway; some of the houses are scattered.
- A few of houses are connected by sub-pathways; some of the houses are scattered and connected with trails.
- The pathway is along the east-west direction.

PUBLIC BUILDINGS

- Public buildings are at the edge of the village.
- These buildings are constructed during the last 15 years, and due to easy approach from the road all the buildings are near the road.

SETTLEMENT

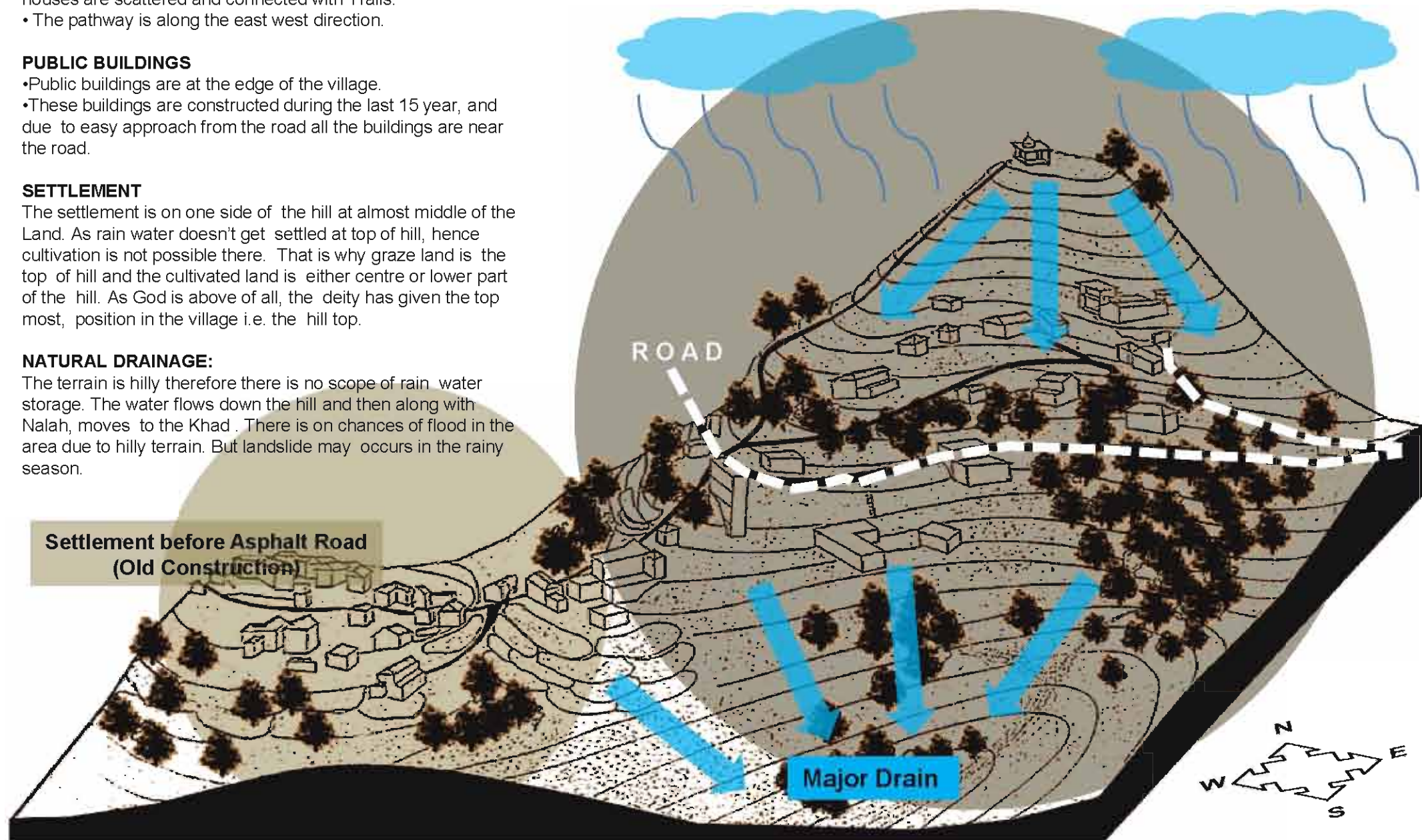
The settlement is on one side of the hill at almost the middle of the land. As rainwater doesn't get settled at the top of the hill, hence cultivation is not possible there. That is why grazing land is the top of the hill and the cultivated land is either the centre or lower part of the hill. As God is above of all, the deity has given the top-most position in the village i.e. the hill top.

NATURAL DRAINAGE:

The terrain is hilly; therefore, there is no scope of rainwater storage. The water flows down the hill and then along with Nalah, moves to the Khad. There are no chances of flood in the area due to hilly terrain. But landslides may occur in the rainy season.

MAJOR SETTLEMENT INFERENCES

Settlement after Asphalt Road (New Construction)



Settlement before Asphalt Road (Old Construction)

Conclusion

REGARDING DEMOGRAPHY:

Future prospectus: Because of its natural scenic beauty and plentiful land available, Khyah can be developed as an important outskirt to the town of Hamirpur.

Economic opportunities :

•Bio animal husbandry :

to increase the output of animal products like milk, meat , wool etc. modern scientific concepts should be used.

•Eco farming:

Because the soil is not very good for cultivation, scientific biological methods should be used to increase the crop output and to retain pollution at the same time.

•Cottage industry:

Because the women are unemployed due to lack of education and social limitations, employment can be provided at their door steps itself in the form of cottage industries for homemade products like cloths , jewelry, confectionary , artifacts etc.

REGARDING INFRASTRUCTURE

Facilities available: A middle school
A dispensary
A small Panchayat house
A temple for community gathering

Facilities needed: A local market
Community centre
Secondary school
Health centre
Food stall
Parking space.

Physical infrastructure :

- Public Buildings should be universally accessible , for that ramps are needed to be placed near the existing staircases.
- Roads should be repaired and road width should be increased to 3.5 m minimum.
- Covered drainage system should be provided.
- Also drainage along roads should not alter it and level should be made to maintain hygiene.
- Pipe lines running on the pathways should be kept underground
- One more water tank can be added to fulfill the water needs

Social Infrastructure:

- Health centre should be enlarged with more medical facilities.
- Separate buildings for Anganbadi should be provided and motivation towards it is needed.
- Recreation facilities for school children should be provided
- Secondary school building and up gradation of primary school is required.
- A play ground must be provided for school children.

REGARDING MASTER PLAN:

From the studies and observations we have concluded the following points which should be taken in to consideration in future planning.

- As there is negligible space between the houses whereas it should be about 2 to 3 m.
- Proper planning of the houses should be done which includes the kitchen, toilets with in the building.
- Offsets of the building from the main road should be about 1m from main road.
- As site has got slope, building construction can be done in steps.
- Cultivation is being done in steps farming prevents the soil erosion.
- Proper path way should be given to the public building to make the building easily approachable.
- The houses should not be more than 2 stories.

REGARDING VERNACULAR ARCHITECTURE:

3 basic house planning are prevalent in this village: Linear
Courtyard
L – shape

- These planning provide easy accessibility to all the rooms.
- Considering the climatic condition these planning allow for proper sunlight during winters and enough ventilation for summers to all rooms. In courtyard planning the open space within the house also acts as area for female member of the house.
- A very typical feature of village is that kitchen of most of the houses are located on the first floor.
- This location of kitchen on the first floor helps in keeping the rooms beneath it warm.
- Kitchen on the first floor also gives easy way for smoke to get out.
- Iron jaali is provided in most of the houses to cover their balcony façade.
- These jaalis act as screening for the balcony space thus enabling the sun light to get through in winter and providing proper shadings in summers.
- These jaalis also provide covering for the balcony space thus enabling it for more intimate activity.

Considering the climatic condition traditional building materials acts perfectly in providing comfort within the house.

Slate is used as roofing material .this checks the heat transfer through it as some air gets trapped. Between its layers. Thus it remains the cool during the daytime and remains the heat during the night time.

Mud blocks is used for making walls. These blocks are very thick and have some embedded leaves in them thus they check the transfer of heat and provide a comfortable atmosphere with in the house. However termite is a big issue for this type of building, so there is some scope of research in mud block construction.

Mud plaster is not a very convincing idea for the village which receives heavy rainfalls. For this more sustainable materials needed to be replaced in the Vernacular Architecture System.

Guide: Ar. Amitava Sarkar

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Report Done: Khyah Village Settlement, Hamirpur, Himachal Pradesh, India